

Pontes Initial Enhancements User Requirements Document (URD)

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1 INTRODUCTION

1.1 BACKGROUND

Pontes is a TARGET Service for the wholesale settlement of tokenised central bank money (“**CeBM**”). This service intends to establish interoperability between Market DLT Platforms¹ and the TARGET services’ ecosystem, allowing Participants and Market DLT Operators to settle wholesale DLT-based transactions.

The project’s roadmap outlines the following milestones:

1. Pontes Initial Launch (scheduled for 2026), with its scope described in the relevant *Business Description Document (BDD)*².
2. Pontes Initial Enhancements (scheduled for 2027), with its scope detailed in this document.
3. Pontes Enhanced Product (scheduled for 2028), with its scope detailed in the *Pontes User Requirements Document (URD)*³.

For the purposes of this document, any further reference to “Pontes” is limited to the scope of Pontes Initial Enhancements, unless explicitly stated otherwise.

Pontes is integrated into and maintains the legal and regulatory structure of the TARGET Services, while operating functionally and technically outside the TARGET Services perimeter.

Pontes foresees a dual settlement model:

- 1) It provides its settlement functionalities on a Eurosystem Distributed Ledger Technology platform, a permissioned DLT-based platform, which provides settlement in tokenised CeBM. Pontes’ use cases with settlement in tokenised CeBM include Delivery-versus-Payment (DvP), Payment-versus-Payment (PvP), wallet-to-wallet and Payment Free of Delivery (PFoD) transactions, as defined in this document.
- 2) It provides settlement functionalities triggered via the Eurosystem Distributed Ledger Technology platform in CeBM in T2 RTGS. Pontes’ use cases with direct settlement in T2 RTGS include DvP, PvP and Payment transactions, as defined in this document⁴.

This chapter outlines the Pontes project scope that the remaining chapters in the document further detail. This chapter also presents the principles that shall serve as the foundation for the service. In addition, this chapter presents the method for organising and presenting user requirements in subsequent chapters and directs readers to the glossary of terms.

¹ “Market DLT Platform” refers to a DLT service platform used by Market DLT Operator(s) where eligible assets are cleared and/or settled and/or delivered.

² See [Business Description Document](#) (BDD).

³ See [Pontes User Requirements Document](#) (URD).

⁴ Direct settlement in T2 RTGS, available in Pontes Initial Launch and in Pontes Initial Enhancements, is out of scope for Pontes Enhanced Product.

1.2 OBJECTIVES

The main objectives of the envisaged service are:

- **to preserve the pivotal role of central bank money (CeBM) in wholesale settlement.** Ensure that the CeBM remains the safest, preferred settlement asset for tokenised wholesale transactions. Private sector substitutes are considered to be sub-optimal and carry higher risks to the Eurosystem's core objectives and mandate, with concerns including the potential to undermine monetary sovereignty, transparency shortcomings and risks of capital flight from European credit institutions.
- **to pursue the Eurosystem mandate.** Ensure stability and resilience of the monetary and financial system within its competence.
- **to strengthen the strategic European Union (EU) autonomy and resilient European payments and capital markets ecosystem.** Ensure tokenisation and innovation develops in Europe in a safe and resilient way on European infrastructures and through European providers.
- **to provide Eurosystem's guidance in a technological and financial changing market.** Ensure the Eurosystem's guidance in next-generation market infrastructures, supporting a coherent policy direction in the emerging technological financial market landscape.
- **to support market needs and innovation.** Enable automated workflows (e.g. DvPs, PVPs, lifecycle management...) on Market DLT Platforms while keeping settlement in central bank money, catalysing EU-based innovation.
- **to broaden the settlement landscape beyond traditional Financial Market Infrastructures (FMIs).** Offer an interoperable pathway for tokenised assets to settle in CeBM in the TARGET Services, complementing offers by existing FMIs and reducing operational frictions.
- **to mitigate fragmentation via an interoperable Eurosystem solution.** Deliver cross-DLT interoperability and liquidity integration, fostering EU financial integration and lowering barriers to cross-border activity.
- **to advance European Union (EU) policy goals.** Provide enabling infrastructure for digital capital markets, supporting the Savings and Investments Union (SIU) objectives in Europe in addition to the international role of the euro.

1.3 SCOPE AND DESCRIPTION

Pontes is a service to enable settlement of Distributed Ledger Technology (DLT)-based wholesale transactions in central bank money (CeBM), in a tokenised form on the Eurosystem DLT or with direct settlement in T2 RTGS. It provides an operational bridge between Market DLT Platforms and the Eurosystem's TARGET Services, allowing DLT-based transactions to settle safely and efficiently in CeBM.

Pontes shall provide settlement services in Euro. It shall be able to process transactional volumes in line with the non-functional requirements defined in this document, with settlement availability in line with T2 RTGS operating hours.

Pontes shall support a dual settlement model, allowing wholesale transactions to be settled, on a transaction-by-transaction basis, either in tokenised CeBM on a Eurosystem Distributed Ledger Technology (DLT) platform or in CeBM directly in T2 RTGS, depending on the settlement model selected.

In the case of settlement in tokenised CeBM, Pontes shall allow the Eurosystem to retain full control over the tokenised CeBM provided on the Eurosystem DLT. Pontes shall be established legally as a TARGET Service: the service shall host a new account type, as defined in this document (e.g. Dedicated Cash Wallet (DCW)), to hold tokenised CeBM.

The service shall enable interoperability with Market DLT Platforms, meaning that the service shall allow the Pontes Actors, as defined in this document, to settle wholesale payments, as well as the payment leg on the Eurosystem DLT of DvP and PvP transactions. The settlement of the other leg will be provided on the respective Market DLT Platforms. The settlement finality of the leg on the Market DLT platforms, where relevant, will be dependent on the rules applicable to the relevant Market DLT Operator.

For the settlement of the payment leg of transactions involving another leg on a Market DLT Platform, Pontes shall support all assets meeting the eligibility criteria defined by the Eurosystem.

The service shall comply with the standards for safety, resilience, cybersecurity, operational reliability, confidentiality, integrity, and availability as detailed in the non-functional requirements in chapter 11. The service shall offer transparent and non-discriminatory access criteria and ensure equal treatment for all participants regardless of location, as long as the location of the Participant (and /or the Market DLT Operator) complies with the policy decision of the Eurosystem. Pontes shall rely exclusively on its infrastructure components operated within the Pontes technical perimeter under the Pontes governance, with no Pontes-operated components on Market DLT Platforms. In the context of this document infrastructure components refer to software and/or hardware components.

1.4 GENERAL PRINCIPLES

Pontes shall be based on the below principles:

- Principle 1:** Dual settlement model with direct settlement in T2 RTGS and settlement in tokenised CeBM on the Eurosystem DLT.
- Principle 2:** Integration in the legal perimeter of TARGET Services, supporting interoperability within the current ecosystem.
- Principle 3:** Immediate settlement with finality of the wholesale payments as well as the payment leg on the Eurosystem DLT of transactions in tokenised CeBM (irrevocable settlement) or directly in CeBM in T2 RTGS, in accordance with the TARGET legal, operational and risk management framework.
- Principle 4:** For the purpose of the settlement in tokenised CeBM on the Eurosystem DLT, Pontes shall trigger the automatic repatriation of all tokenised CeBM balances at the end of each business day, as such balances may not be held overnight on the Eurosystem DLT.
- Principle 5:** Pontes shall provide settlement services in Euro.
- Principle 6:** Settlement on a 22,5/5 basis, in line with T2 RTGS operating hours.
- Principle 7:** Legal certainty through compliance with a harmonised and adaptable legal framework, while evolving with market best practices and policy requirements.

1.5 ORGANISATION AND PRESENTATION OF THE USER REQUIREMENTS

The Pontes User Requirements Document is organised into chapters presenting the various aspects of the project.

- **Chapter 1: Introduction** – describes the purpose of this document; recalls the principles on which Pontes is built; and provides guidance on how to read this document.
- **Chapter 2: High-level Process Description and Architecture** – aims at identifying the Pontes Actors, presenting the overall scope and process description of the service.
- **Chapter 3: Eurosystem DLT** – aims at describing requirements that are DLT-specific, such as DLT network requirements, replication of data across the nodes and consensus-related requirements.
- **Chapter 4: Settlement in tokenised central bank money** – identifies requirements for the main use cases of the service (e.g. DvPs, PVPs and wholesale payments⁵).
- **Chapter 5: Liquidity Management** – aims at describing the transfer of liquidity between Pontes and T2 RTGS. In this context, Pontes supports the funding (inbound liquidity transfer) and defunding (outbound liquidity transfer) operations from/to T2 RTGS allowing management of tokenised CeBM of any Pontes DCW. Furthermore, Pontes supports intra service liquidity transfers, intended as wallet-to-wallet transfer (between two DCWs belonging to the same Participant).
- **Chapter 6: Management of Wallets and Reference Data** – identifies requirements relevant to the management of wallets and other reference data in Pontes and, where relevant, in the Common Reference Data Management (CRDM) component of the TARGET Services.
- **Chapter 7: Reports** – identifies requirements for the reports that Pontes will provide.
- **Chapter 8: Queries** – identifies requirements for the queries that are available in Pontes.

⁵ For the purpose of this document, wholesale payments are wallet-to-wallet payments as described in chapter 4.3.1 and payments with direct settlement in T2 RTGS as described in chapter 4.3.2.

- **Chapter 9: Interfaces** – identifies requirements pertaining to the technical communication of the Pontes interface with the different Pontes Actors, the internal interface to the other TARGET Services and the technical communication among the nodes of the Eurosystem DLT.
- **Chapter 10: Other Functions** – identifies requirements regarding other functions relevant to Pontes (e.g. end-of-day processing).
- **Chapter 11: Non-Functional Requirements** – aims at describing the non-functional requirements of Pontes.
- **Chapter 12: Statistical Information** – identifies requirements for the statistical information reports that will be available in Pontes.
- **Chapter 13: Annex** – collects the list of references, glossary and acronyms.

Individual requirements are grouped according to topic and in principle each requirement is presented with attributes. The different user requirements as presented in tables have the following attributes:

ID: This field specifies the unique reference. The identification of the requirement is a unique number, which will be valid for this requirement throughout the project. After agreement, it will be possible for any party to refer to this requirement via this ID. Requirements' substance and wording will evolve over time. Using the identification number, it will be possible to trace any modification of the requirements. Furthermore, the acceptance tests will be linked to the user requirements using this ID.

To reflect the evolution of the scope of the project between the Pontes Initial Launch and Pontes Enhanced Product, and to ensure traceability of the requirement lineage, requirements in this document follow a specific identification structure.

Each requirement ID takes the form: PONTES.UR.<ID prefix>.<number>.<lineage category>

The lineage category indicates how the requirement relates to the Pontes Initial Launch (2026) and the Pontes Enhanced Product (2028) baseline:

- **PONTES.UR.<ID prefix>.<number>.1A** – Requirement coming from Pontes Initial Launch, further detailed in this document compared to its description in the Business Description Document (BDD),
- **PONTES.UR.<ID prefix>.<number>.1B** – Requirement described in the Pontes Enhanced Product URD and structurally changed (adapted or reduced in scope) for Pontes Initial Enhancements (in line with Pontes Initial Launch),
- **PONTES.UR.<ID prefix>.<number>.1AB** – Requirement exists in both Pontes Initial Launch and Pontes Enhanced Product, structurally changed (i.e. the behaviour is specific) for Pontes Initial Enhancements,
- **PONTES.UR.<ID prefix>.<number>.2** – Requirement added specifically for Pontes Initial Enhancements.

ID prefix	Chapter name
03	Eurosystem DLT
04	Settlement in central bank money
05	Liquidity Management
06	Management of Wallets and Reference Data
07	Reports
08	Queries
09	Interfaces
10	Other Functions
11	Non-Functional Requirements ⁶
12	Statistical Information

Name: This is a short label of the requirement. It helps the reader to quickly find a requirement within this document.

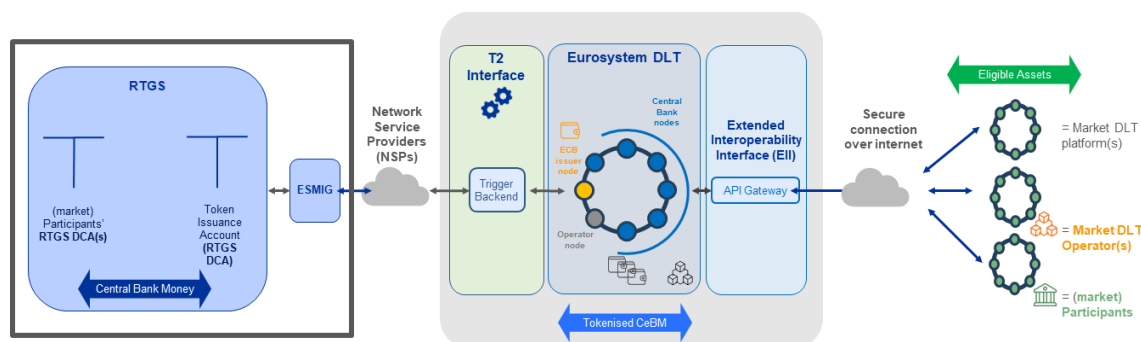
Requirement: This is the requirement, formulated in an unambiguous way. Requirements must be clear, concise, and measurable. The words “shall” “will” or “must” in a requirement indicate a compulsory feature of the system. The words “may” and “should” indicate options.

A detailed description of the requirement may be provided after the table.

⁶ For the Non-Functional Requirements (NFR) described in chapter 11, the requirement ID takes the form: PONTES.NFR.<ID prefix>.<number>.<lineage category>

2 HIGH-LEVEL PROCESS DESCRIPTION AND ARCHITECTURE

This chapter provides an overview of the actors and processes foreseen by the Pontes service.



Pontes consists of the following three interconnected modules:

1. T2 interface,
2. Eurosystem DLT (ESY DLT) platform,
3. Extended Interoperability Interface (EII).

The **T2 interface** is the single-entry point to the TARGET Services via the existing Eurosystem Market Infrastructure Gateway (ESMIG). The Trigger Backend component within the T2 interface enables smooth funding and defunding of intra-day tokenised CeBM and direct settlement in T2 RTGS of transactions coming from the Eurosystem DLT platform. The direct settlement in T2 RTGS relies on the existing functionalities of the TARGET Services. The interaction with T2 envisaged to support Pontes' use cases requires a RTGS Dedicated Cash Accounts (DCAs) in T2 RTGS to be used as Token Issuance Account as described in chapter 5.

The **Eurosystem DLT** refers to the Eurosystem's DLT-based component that manages the payment leg of DLT-based transactions. The Eurosystem DLT is a permissioned DLT-based platform, and it comprises Central Bank nodes, an Operator node and an (ECB) issuer node. The Eurosystem DLT manages two types of wallets (i.e. DCWs and a Token Issuance Wallet) as described in chapter 3.

The **Extended Interoperability Interface (EII)** is the component that serves as the only entry point to the Eurosystem DLT, via Application Programming Interface (API) and via a Graphical User Interface (GUI). It is also responsible for routing requests to the correct node on the Eurosystem DLT.

2.1 ACTORS

The major actors of the Pontes service are the following:

- **Participants:**
 - Participants are the entities⁷ that hold DCWs in Pontes or RTGS DCAs in T2 RTGS. In Pontes, it is a precondition for a Participant to have an account in T2 RTGS to participate. Holding a RTGS DCA is required for both settlement models,
 - Participants manage their own tokenised CeBM and are responsible for all transactions (as defined in this document) sent or received on their wallets,
 - Pontes DCWs are opened by the responsible central bank,

⁷ A Central Bank can act as a Participant in Pontes. Additional information can be found in chapter 6.

- Upon configuration, participants can instruct transactions on behalf of one or more participants (limited to wallet-to-wallet payments on the Eurosystem DLT and payments with direct settlement in T2 RTGS).
- **Market DLT Operators:**
 - Market DLT Operators are the entities that offer DLT-based services on one or more Market DLT Platforms (outside the perimeter of the Pontes service),
 - Upon configuration, Market DLT Operators can instruct transactions on behalf of one or more Participants (limited to the operations described in chapter 4.1.2).
- **Central Banks:**
 - A Central Bank provides cash wallet services to Participants for the settlement in tokenised CeBM, as defined in this document.
 - Additionally, a Central Bank can act as a Participant in Pontes.
- **Pontes Operator:**
 - The Pontes Operator is the entity that technically operates the service,
 - It has unrestricted access to all system data and functionality.

Chapter [6](#) provides a detailed explanation of the actors, including their relationships.

2.2 EUROSYSTEM DLT

To enable the settlement of DLT-based wholesale transactions, Pontes shall be based on a secure, resilient, and reliable DLT-based platform operated under the governance of the Eurosystem.

In particular, the Eurosystem DLT shall ensure reliable operations even in the presence of technical failures affecting the nodes that are part of the DLT network.

Chapter [3](#) collects user requirements related to the Eurosystem DLT, including network-related, data replication and monitoring requirements.

2.3 SETTLEMENT IN CENTRAL BANK MONEY

Pontes shall support Pontes Actors to settle Euro transactions in tokenised CeBM on the Eurosystem DLT as well as in CeBM in T2 RTGS.

In particular, Pontes:

1. provides its settlement functionalities on a Eurosystem Distributed Ledger Technology platform, a permissioned DLT-based platform, which provides settlement in tokenised CeBM. Pontes' use cases with settlement in tokenised CeBM include DvP, PvP, wallet-to-wallet payment and PFoD transactions, as defined in this document.
2. provides settlement functionalities triggered via the Eurosystem Distributed Ledger Technology platform in CeBM in T2 RTGS. Pontes' use cases with direct settlement in T2 RTGS include DvP, PvP and Payment transactions, as defined in this document.

Chapter [4](#) details the available use cases for Pontes as well the available settlement-related operations.

2.4 LIQUIDITY MANAGEMENT

Wallets in Pontes shall be wallets opened in the books of a Central Bank and are exclusively dedicated for the settlement of transactions in tokenised CeBM.

Pontes shall allow the transfer of liquidity between accounts in T2 RTGS and wallets in Pontes during the Pontes' operating hours. In this context, Pontes supports the funding (inbound liquidity transfer) and defunding (outbound liquidity transfer) operations from/to T2 RTGS allowing management of tokenised CeBM of any Pontes DCW. Moreover, Pontes shall allow the transfer of funds between two wallets (wallet-to-wallet transfer), being these two DCWs belonging to the same Participant.

Pontes shall enforce a mandatory defunding of all tokenised CeBM balances at the end of each Pontes business day, ensuring that no Participant holds tokenised balances overnight.

Chapter [5](#) provides additional information liquidity management operations in Pontes.

2.5 MANAGEMENT OF WALLETS AND REFERENCE DATA

Central Banks shall be responsible for maintaining the reference data of their respective community and shall act on behalf of their participants in contingency (i.e., for liquidity management, static data queries and reference data changes).

Participants will be able to open one or more DCW(s) in Pontes in order to segregate their business.

Each Central Bank node of the Eurosystem DLT securely stores data in a Local Reference Data Management (LRDM) component to allow for the setup of its participants and related wallets. The LRDM component caters for participants' access rights management information, participants' configuration related to settlement on Eurosystem DLT with tokenised CeBM, DCW-related information, Market DLT Operators and Market DLT Platforms related information.

A minimum set of configurations⁸ in the Common Reference Data Management (CRDM) component of the TARGET Services will be required to enable the automated interactions of Pontes with T2 RTGS. CRDM is the common component of the TARGET Services that provides users with interfaces allowing the creation, updating and deletion of common reference data related to parties, cash accounts and configuration rules and parameters.

Chapter [6](#) provides additional information regarding wallets and reference data management-related operations, as well as the minimum set of configurations required in the TARGET Common Reference Data Management.

2.6 QUERIES AND REPORTS

Pontes will offer queries and reports on demand to the Participants to support monitoring and reconciliation. Chapter [8](#) and chapter [7](#) provide additional information regarding queries and reporting functionalities in Pontes, respectively.

2.7 INTERFACES

Pontes shall provide an application-to-application (A2A) interface for transaction processing. Pontes will have a user-to-application interface (U2A) for a functionalities and queries, such as liquidity transfers, transactions, wallet blocking. Chapter [9](#) details Pontes interfaces, including details for A2A and U2A interactions.

⁸ The configuration is limited to the setup of a Settlement Bank Account Group (SBAG) as described in chapter 6.4.7.

3 EUROSYSTEM DLT

Pontes shall allow the Eurosystem to retain full control over the tokenised CeBM provided on the Eurosystem DLT platform, including funding, defunding and intra service liquidity transfers, as well as transactions.

Pontes shall enable issuance and redemption of CeBM in the form of DLT-based tokens. Pontes shall enable settlement of the payment leg of DLT-based transactions in tokenised form on the Eurosystem DLT or via the direct settlement in T2 RTGS.

3.1 GENERAL REQUIREMENTS

Id	PONTES.UR.03.010
Name	Permissioned Eurosystem DLT platform
Description	Pontes shall be based on a secure, resilient, and reliable private permissioned DLT Eurosystem platform owned and operated under the governance of the Eurosystem.

The Eurosystem DLT comprises a set of nodes:

Central Bank nodes	Each node, one for each Eurosystem Central Bank, is owned by the Central Bank and hosted, managed and operated by the Pontes Operator. Each Central Bank node technically signs transactions relevant to them (i.e. transactions instructed by one of its Participants), validates new blocks received and adds them to its local copy of the ledger. Each Central Bank via its node creates, revokes, stores and manages data (e.g. DCWs, static data ⁹ and transactions-related data) related to its Participants.
Operator node	The Operator node is owned and hosted, managed and operated by the Pontes Operator. This node has the following responsibilities: 1. Manage the list of participating NCBs, 2. Manage the platform parameters (e.g. business day and country codes), 3. Manage activity in the ESY DLT (e.g. key performance indicators).
(ECB) issuer node	The issuer node is owned by the ECB and hosted, managed and operated by the Pontes Operator. This node issues and redeems tokenised CeBM in the ESY DLT and hosts the Token Issuance Wallet.

⁹ Each Central Bank node of the Eurosystem DLT manages its Participants' data in a Local Reference Data Management (LRDM) component. The LRDM contains Participants' information, wallets-related static data and node parameters that can be queried on demand. Additional details are provided in chapter 6.

ID	PONTES.UR.03.020.1B
Name	Participant access and processing of requests
Requirement	Pontes shall provide access to its functionalities for both User-to-Application (U2A) and Application-to-Application (A2A) interactions with requests routed to the relevant Central Bank node based on the sender of the request.

3.2 NETWORK

ID	PONTES.UR.03.030.1B
Name	Network design and node architecture
Requirement	Pontes shall define and maintain a geographically distributed network architecture that ensures resilience, redundancy, and scalability in line with the non-functional requirements defined in this document. This would include a sufficient number and distribution of nodes to meet service, security, and governance requirements as defined by the Eurosystem.

The geographical distribution of the Pontes architecture shall align with the deployment model defined for the scope. Pontes is operated through predefined infrastructure regions. All technical components needed for interoperability transactions, including the nodes comprising Pontes' architecture shall be hosted by the Pontes Operator.

ID	PONTES.UR.03.040
Name	Consensus mechanism
Requirement	Pontes shall utilise a robust, fast and efficient consensus mechanism that is fully under control of the Eurosystem and in line with Eurosystem policy.

ID	PONTES.UR.03.050.1B
Name	Secure consensus mechanism
Requirement	Pontes shall employ a consensus mechanism that ensures secure and reliable agreement on transaction validation and ordering, even in the presence of technical failures affecting nodes, such that the integrity and availability of the system's operations are not compromised.

ID	PONTES.UR.03.060
Name	Validation and continuity of service
Requirement	Pontes shall ensure that transactions and data entries are validated in an orderly and efficient manner by the nodes before being added to the ledger, in accordance with the rules defined by the Eurosystem in the current document.

ID	PONTES.UR.03.070.1B
Name	Processing of transactions
Requirement	Pontes shall process all transactions without prioritisation or reordering of transactions.

ID	PONTES.UR.03.080.1B
Name	Shared ledger availability features
Requirement	Pontes shall provide availability for settlement in accordance with the non-functional requirements defined in this document (see PONTES.NFR.11.030).

Id	PONTES.UR.03.090
Name	Shared ledger security features
Description	Pontes shall ensure that the integrity of the shared ledger is guaranteed at all times by the usage of a secure consensus mechanism (PONTES.UR.050) and the utilization of digital signatures.

Id	PONTES.UR.03.100.1B
Name	Availability of consensus mechanism
Description	The service shall ensure that a sufficient number of nodes are active to maintain continuous operation. Conversely, in case of insufficient number of nodes contributing to the consensus mechanism, Pontes shall cease processing transactions and reject them accordingly.

Id	PONTES.UR.03.110.1B
Name	Network inquiries
Description	Pontes shall route the inquiries from the Pontes Actors, evaluate the health and status of available nodes (e.g. whether the node has the latest version of the ledger) and route each inquiry to the most appropriate Central Bank node, i.e. based on the requestor.

3.3 DATA

ID	PONTES.UR.03.120
Name	Data localisation
Requirement	Pontes shall ensure that all data processed and stored within the system resides within the European Economic Area (EEA). Any exceptions shall require explicit Eurosystem approval.

ID	PONTES.UR.03.140.1B
Name	Data segregation by jurisdiction
Requirement	Pontes shall provide a data segregation by jurisdiction, with one node per Central Bank able to manage the requests of their participants.

3.4 MONITORING

ID	PONTES.UR.03.190
Name	Real-time monitoring of nodes
Requirement	Pontes shall implement real-time monitoring of nodes and network health, performance, and connectivity. Automated alerts and escalation procedures shall be established to enable rapid detection and response to anomalies, outages, or security incidents affecting nodes of the network.

4 SETTLEMENT IN CENTRAL BANK MONEY

The objective of this chapter is to describe the core functionality of the Pontes service:

- Chapter 4.1 provides a high-level overview of the use cases of Pontes,
- Chapter 4.2 covers requirements related to the interoperability transactions, i.e. DvP and PvP,
- Chapter 4.3 covers requirements related to one-leg transactions, i.e. wallet-to-wallet payments,
- Chapter 4.4 covers requirements related to PFoD transactions,
- Chapter 4.5 covers general requirements relevant for the various settlement operations.

4.1 OVERVIEW

ID	PONTES.UR.04.010.1B
Name	Type of transactions supported
Requirement	Pontes shall support the settlement of DvP transactions (with the delivery leg on the Market DLT Platforms), PvP transactions (with one payment leg on the Market DLT Platforms), PFoD transactions and wholesale payments, each with the specific characteristics set out in this document.

Pontes shall enable:

1. its settlement functionalities on a Eurosystem Distributed Ledger Technology platform, a permissioned DLT-based platform, which provides settlement in tokenised CeBM. Pontes' use cases with settlement in tokenised CeBM include DvP, PvP, wallet-to-wallet payment and PFoD transactions, as defined in this document.
2. settlement functionalities triggered via the Eurosystem Distributed Ledger Technology platform in CeBM in T2 RTGS. Pontes' use cases with direct settlement in T2 RTGS include DvP, PvP and Payment transactions, as defined in this document.

Wallets (Dedicated Cash Wallets – DCWs) are used for settlement in tokenised CeBM on the Eurosystem DLT, while RTGS DCAs are used for direct settlement in T2 RTGS. A transaction shall use only one settlement mechanism, and the two mechanisms are mutually exclusive at transaction level.

Id	PONTES.UR.04.020
Name	Settlement with finality in tokenised CeBM
Description	Pontes shall settle the instructed amount with finality in tokenised CeBM on wallets on the Eurosystem DLT. Settlement shall be final with the meaning of the Settlement Finality Directive (SFD).

Settlement in tokenised CeBM shall be equivalent in legal effect to settling transactions in existing TARGET Dedicated Cash Accounts (DCAs) under the Settlement Finality Directive (SFD), and its future evolutions and the applicable national legal frameworks.

The settlement finality of the leg on the Market DLT Platforms, where relevant, will be dependent on the rules applicable to the relevant Market DLT Operator.

ID	PONTES.UR.04.540.1A
Name	Settlement in CeBM directly in T2 RTGS
Requirement	Pontes shall settle the instructed amount with finality in CeBM in T2 RTGS when the payment leg is executed via T2 RTGS directly. Settlement shall be final with the meaning of the Settlement Finality Directive (SFD).

The settlement finality of the leg on the Market DLT Platforms, where relevant, will be dependent on the rules applicable to the relevant Market DLT Operator.

ID	PONTES.UR.04.030.1A
Name	Euro currency
Requirement	Pontes shall support settlement in Euro ¹⁰ .

ID	PONTES.UR.04.040
Name	Automated operations
Requirement	Pontes shall enable settlement of transactions within the scope of Pontes in an automated way, with manual intervention of Pontes Operator limited to predefined contingency procedures, as defined in the operational-related documents (which are outside the scope of the current document).

ID	PONTES.UR.04.550.1A
Name	Settlement mode selection
Requirement	Pontes shall allow the Pontes Actor to choose between the available settlement models for each transaction.

¹⁰ Despite not foreseen for Pontes Initial Enhancement, Pontes Enhanced Product shall support a multi-currency design, for all currencies available in T2 CLM - see also the relevant [User Requirements Document \(URD\)](#).

4.1.1 Participants' settlement-related functionalities

Table 4.1: Settlement-related functionalities available to Participants

Participants' settlement-related functionalities ¹¹	U2A (2-eyes)	U2A (4-eyes)	A2A (1-step)	A2A (2-steps)
Tokenised CeBM - Wallet to Wallet Payment ¹²		✓	✓	✓
Tokenised CeBM - DvP Initialisation PvP Initialisation			✓	
Tokenised CeBM - DvP Payment PvP Payment			✓	
Tokenised CeBM - (DvP) Initialisation Query (PvP) Initialisation Query			✓	
Tokenised CeBM - (DvP) Get Key and Payment Information (PvP) Get Key and Payment Information			✓	
Tokenised CeBM - PFoD DELI Initialisation			✓	
Tokenised CeBM - PFoD DELI Initialisation			✓	
Direct settlement in T2 RTGS - Payment ¹³		✓	✓	✓
Direct settlement in T2 RTGS - DvP Initialisation PvP Initialisation			✓	
Direct settlement in T2 RTGS - DvP Payment PvP Payment			✓	
Direct settlement in T2 RTGS - (DvP) Initialisation Query (PvP) Initialisation Query			✓	
Direct settlement in T2 RTGS - (DvP) Get Key and Payment Information (PvP) Get Key and Payment Information			✓	

Liquidity management operations like *funding* (as an inbound liquidity transfers from the perspective of Pontes), *defunding* (as an outbound liquidity transfers from the perspective of Pontes), and *intra service liquidity transfer* (intended as wallet-to-wallet transfer between two wallets belonging to the same Participant) are described in chapter 5.

¹¹ The table applies also to Central Banks acting as a Participant in Pontes.

¹² Upon configuration, a Participant can instruct wallet-to-wallet payments on behalf of another Participant.

¹³ Upon configuration, a Participant can instruct payments with direct settlement in T2 RTGS on behalf of another Participant.

4.1.2 Market DLT Operators' settlement-related functionalities

Table 4.2: Settlement-related functionalities available to Market DLT Operators

Market DLT Operators' settlement-related functionalities ¹⁴	U2A (2-eyes)	U2A (4-eyes)	A2A (1-step)	A2A (2-steps)
Tokenised CeBM - Wallet to Wallet Payment			✓	
Tokenised CeBM - DvP Initialisation PvP Initialisation			✓	
Tokenised CeBM - DvP Payment PvP Payment			✓	
Tokenised CeBM - (DvP) Initialisation Query (PvP) Initialisation Query			✓	
Tokenised CeBM - (DvP) Get Key and Payment Information (PvP) Get Key and Payment Information			✓	
Tokenised CeBM - PFoD DELI Initialisation			✓	
Tokenised CeBM - PFoD DELI Initialisation			✓	
Direct settlement in T2 RTGS - Payment			✓	
Direct settlement in T2 RTGS - DvP Initialisation PvP Initialisation			✓	
Direct settlement in T2 RTGS - DvP Payment PvP Payment			✓	
Direct settlement in T2 RTGS - (DvP) Initialisation Query (PvP) Initialisation Query			✓	
Direct settlement in T2 RTGS - (DvP) Get Key and Payment Information (PvP) Get Key and Payment Information			✓	

¹⁴ Upon configuration, a Market DLT Operator can instruct transactions on behalf of Participants.

4.2 INTEROPERABILITY TRANSACTIONS

This chapter outlines the requirements for DvP and PVP transactions, with one leg within Pontes (the payment leg) and the other leg on a Market DLT Platform.

ID	PONTES.UR.04.050.1B
Name	Robust interoperability mechanism
Requirement	Pontes shall ensure that, for any transaction requiring the all-or-none settlement of two legs, one for the Eurosystem and one for the Market DLT Platform (i.e., DvP and PVP), the interoperability mechanism is able to maintain stable and continuous operation.

Pontes relies on the Hash-Link protocol.

The two legs one on the Eurosystem DLT and one on the Market DLT Platform are interdependent and conditional upon the same cryptographic proofs. Consequently, both legs of the transaction must be settled successfully and irrevocably, or neither is settled, thereby eliminating principal risk and preventing any partial completion under all circumstances.

Figures 4.1 and 4.2 together with 4.3 illustrate the two phases of the workflow for a DvP transaction using the Hash-Link protocol¹⁵. The steps in the overall process are further detailed in the document. Exceptional cases, such as validation errors, are not depicted in the diagram, but mentioned in the explanations following the diagram.

The entities communicating with Pontes are:

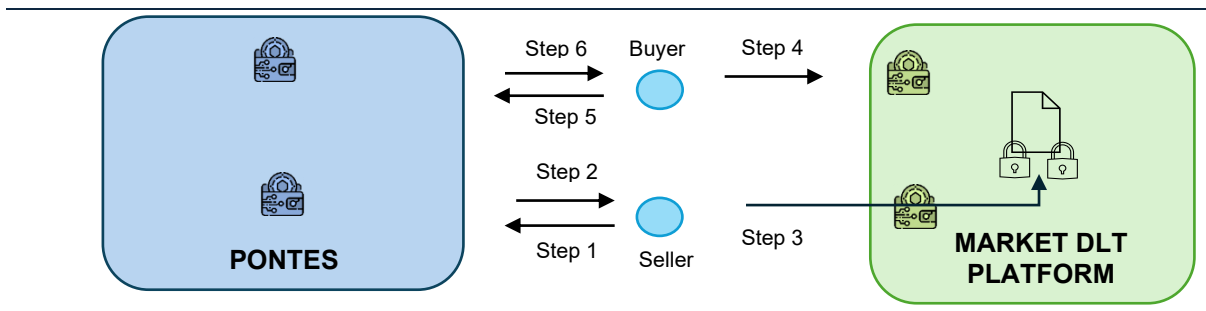
- (i) The Buyer meaning a Participant (acting for itself) or a Market DLT Operator (acting on behalf of the Participant). In the context of the DvP transaction, it is the buyer (or a Market DLT Operator acting on behalf of the buyer) of an eligible asset on a Market DLT Platform. It communicates with Pontes to debit a wallet.
- (ii) The Seller meaning a Participant (instructing for itself) or a Market DLT Operator (instructing on behalf of the Participant). In the context of the DvP transaction, it is the seller (or a Market DLT Operator acting on behalf of the seller) of an eligible asset on a Market DLT Platform. It communicates with Pontes to initialise the DvP and to check that a wallet has been correctly credited.

¹⁵ The same workflow applies for PVP transactions.

Phase 1 – Initialisation

Figure 4.1

DvP with Hash-Link - Phase 1: initialisation



Step 1: The Seller sends a DvP Initialisation Request to Pontes. This request must contain all the mandatory fields to enable Pontes to perform its checks (see for example PONTES.UR.09.180.1B). After successful validation, Pontes generates and stores two cryptographic keys (Execution Key and Cancellation Key) and the related hashes. Pontes keeps track of a timeout, by when the payment leg of the DvP has to be settled.

Step 2: Pontes sends the generated hashes for the Execution Key and Cancellation Key to the Seller.

Step 3 (outside of Pontes): The Seller creates a Hash-Link Contract (HLC) on the Market DLT Platform with the information received as response of the DvP Initialisation Request. The Seller locks the relevant asset in the HLC on a Market DLT Platform. The asset is locked until one of the following conditions is satisfied:

1. The Buyer agrees (providing its signature) to release back the asset to the Seller → see Phase 2b – Unsuccessful scenario;
2. The Seller agrees (providing its signature) to release the asset to the Buyer → see Phase 2a – Successful scenario;
3. The Buyer forces the release of the asset to itself (providing the Execution Key, which is revealed by Pontes after successful settlement of the payment) → see Phase 2a – Successful scenario);
4. The Seller forces the release of the asset to itself (providing the Cancellation Key, which is revealed by Pontes after the timeout, if no payment has been settled) → see Phase 2b – Unsuccessful scenario.

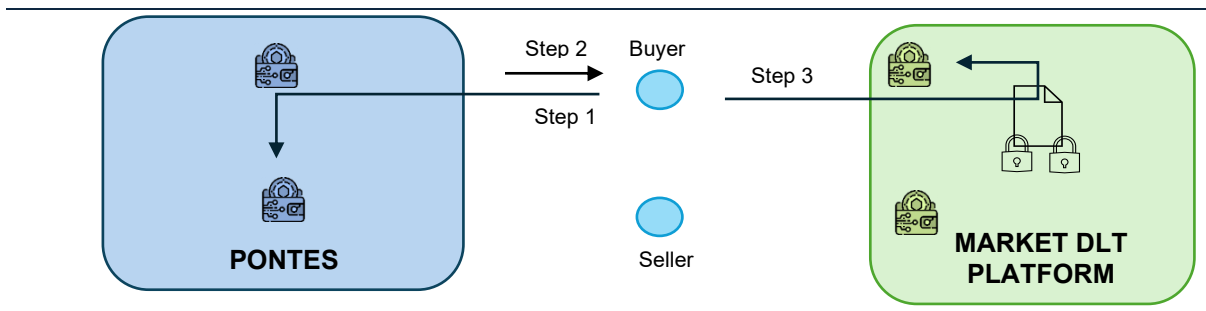
Step 4 (outside of Pontes): The Buyer becomes aware of the DvP identifier (because notified by the Seller or querying the Market DLT Platform).

Step 5/6 (optional): The Buyer sends an (DvP) Initialisation Query to Pontes, providing the DvP identifier. Pontes sends the relevant hashes for the Execution Key and Cancellation Key to the Buyer, which can check the correctness of the Hash-Link Contract (HLC) initialisation.

Phase 2a – Successful scenario

Figure 4.2

DvP with Hash-Link - Phase 2a: Successful scenario



Step 1: The Buyer sends the DvP Payment request to Pontes. If the payment request reached Pontes before the timeout, it performs the validation. After successful validation (including availability of sufficient funds), Pontes settles the amount¹⁶.

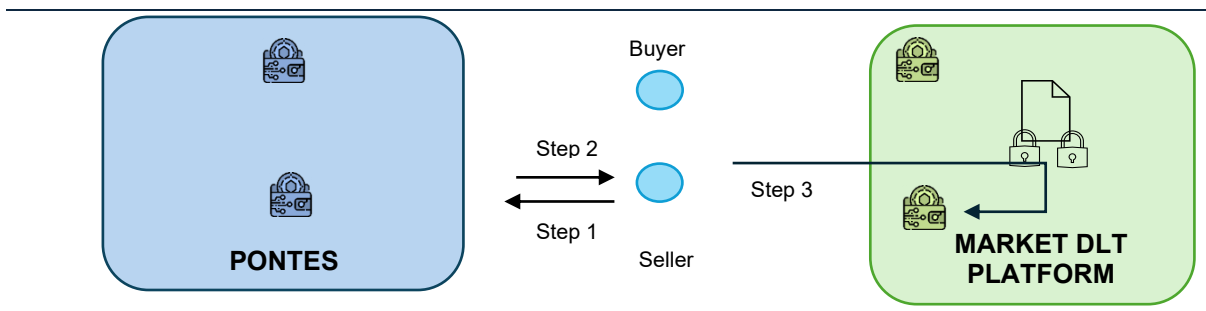
Step 2: Pontes sends a response to the Buyer. In case the payment is settled, the Execution Key is revealed to the Buyer. Otherwise, an error message is returned.

Step 3 (outside of Pontes): If the asset is not released by the Seller, the Buyer forces the release of the asset to itself (providing the Execution Key, revealed by Pontes).

Phase 2b – Unsuccessful scenario (alternative to Phase 2a)

Figure 4.3

DvP with Hash-Link - Phase 2b: Unsuccessful scenario



Step 1: The Seller sends the Get Key and Payment Information request to Pontes. Pontes performs the relevant validation (i.e. the request arrived after the timeout, and no payment has been settled)

Step 2: Pontes sends a response to the Seller. In case of successful validation, Pontes reveals the Cancellation Key. Otherwise, an error message is returned.

¹⁶ The settlement shown in the picture refers to settlement with tokenised CeBM on the Eurosystem DLT. Depending on the chosen settlement model, the payment can happen in T2 RTGS.

Step 3 (outside of Pontes): If the asset is not released back to the Seller by the Buyer, the Seller forces the release of the asset to itself (providing the Cancellation Key, revealed by Pontes).

The agreement between the Buyer and the Seller on the details of the DvP (e.g. amount, asset, ...) is managed outside Pontes and it is not in the scope of this document.

Chapter 6.2 provides further details regarding the different actors and participation structure.

4.2.1 Delivery-versus-Payment

ID	PONTES.UR.04.060.1B
Name	Delivery-versus-Payment (DvP)
Requirement	Pontes shall enable settlement of DvP transactions in tokenised CeBM where the payment leg is settled on the Eurosystem DLT, or in CeBM where the payment leg is settled directly in T2 RTGS. The leg delivering the asset is settled on the relevant Market DLT Platform.

In the context of DvP transactions, Pontes shall foresee operations listed in the following table.

Table 4.3: List of requests and responses for DvP processing

Operation	Request / Response	Description
DvP Initialisation	Request	Sent from the Seller ¹⁷ to request the initiation of the DvP transaction. This entails the creation of Execution Key and Cancellation Key, related hashes, DvP identifier. This message is covered in chapter 9.3.2.
	Response	Response received by the Seller with the status of the relevant initialisation request. Upon correct initialization of the DvP transaction, the Seller receives the DvP instance parameters (i.e. DvP identifier, timeout and Hashed Execution Key and Hashed Cancellation Key) enabling the Seller to lock the asset in a Hash-Link Contract (HLC) smart contract on the Market DLT Platform. This message is covered in chapter 9.3.2.
(DvP) Initialisation Query	Request	Sent from the Buyer ¹⁸ (or the Seller) to query an initialised DvP instance and retrieve its parameters. This would allow the Buyer for data validation, before sending the correspondent DvP Payment. This message is covered in chapter 9.3.2.
	Response	Response received by the Buyer (or the Seller) containing all the relevant data related to an initialised DvP instance. This message is covered in chapter 9.3.2.
DvP Payment	Request	Sent from the Buyer to settle the payment leg of a DvP transaction. This message is covered in chapter 9.3.2.

¹⁷ In the context of a DvP transaction, Seller means a Participant (instructing for itself) or a Market DLT Operator (instructing on behalf of the Participant). It is the seller (or acts on behalf of the seller) of an eligible asset on a Market DLT Platform. It communicates with Pontes to initialise the DvP and to check that a wallet has been correctly credited.

¹⁸ In the context of a DvP transaction, the Buyer means a Participant (acting for itself) or a Market DLT Operator (acting on behalf of the Participant). It is the buyer (or acts on behalf of the buyer) of an eligible asset on a Market DLT Platform. It communicates with Pontes to debit a wallet.

	Response	Response received by the Buyer with the status of the payment. Upon successful settlement, the Buyer receives a SETTLED payment status, together with the Execution Key that allows for asset unlocking on the Market DLT Platform (otherwise the Execution Key is not revealed to the Buyer). It contains the UNSETTLED payment status, e.g. in case the settlement attempt happens after the timeout. This message is covered in chapter 9.3.2.
(DvP) Get Key and Payment Information (execution)	Request	Sent from the Buyer to query the status of the DvP transaction and retrieve the Execution Key, if the payment has been settled. This message is covered in chapter 9.3.2.
	Response	Response received by the Buyer with the status of the DvP and, if the payment has been successfully settled, the Execution Key. This message is covered in chapter 9.3.2.
(DvP) Get Key and Payment Information (execution)	Request	Sent from the Seller to query the status of the DvP transaction and retrieve the Cancellation Key, if the payment has not been settled and the timeout is expired. This message is covered in chapter 9.3.2.
	Response	Response received by the Seller with the status of the DvP and, if the payment has not been settled successfully and the timeout is expired, the Cancellation Key. This message is covered in chapter 9.3.2.
	Rejection Response	A response sent by Pontes to the Seller (or the Buyer) when Pontes failed to process the specific request due to, e.g. validation errors, rejection of the DvP Payment or timeout. This message is covered in chapter 9.3.2.

4.2.1.1 DvP Initialisation

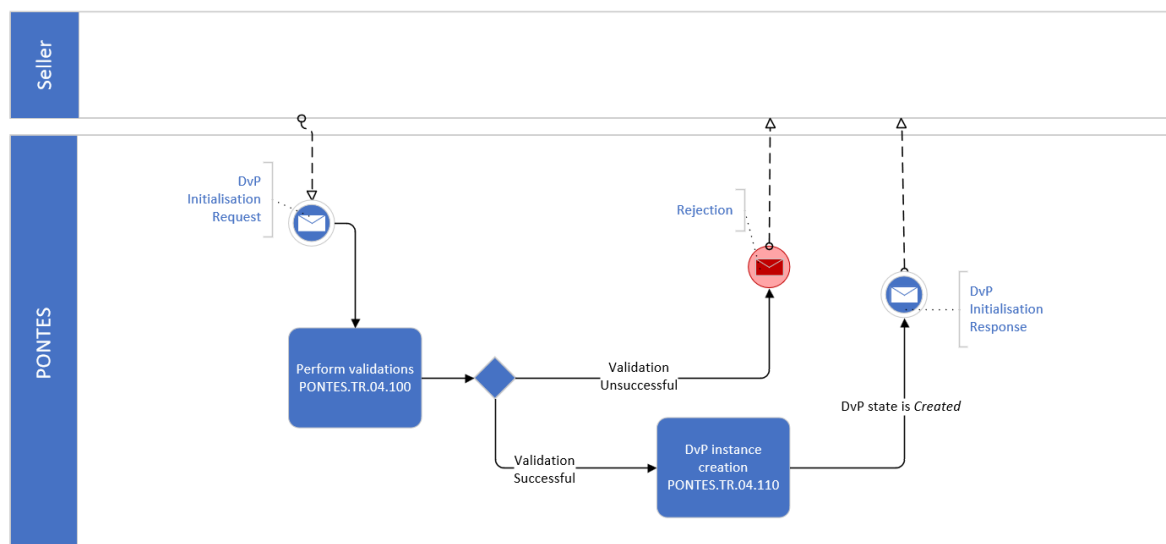


Figure 4.4 - DvP Initialisation Process Diagram

Table 4.4: List of tasks for the DvP Initialisation processing workflow

Task	Description
PONTES.TR.04.100	Execution of technical and business validations after the Seller requests a DvP instance; if the DvP initialisation request received is rejected, the Seller will receive an error response.
PONTES.TR.04.110	Upon successful completion of PONTES.TR.04.100, creation of the initialised DvP instance into Pontes, configured with the data received from the Seller.

ID	PONTES.UR.04.070.1B
Name	DvP Initialisation - Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming DvP Initialisation request.

The performed validations are, at least, the ones defined in PONTES.UR.04.080.1B, PONTES.UR.04.090.1B, PONTES.UR.04.100.1B, PONTES.UR.04.110.1B. Moreover, all the rules defined in chapter 4.5 apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.180.1B.

ID	PONTES.UR.04.080.1B
Name	Derivation of wallet on the creditor side
Requirement	Pontes shall identify for each transaction the wallet to credit. Pontes shall determine the wallet from the Creditor BIC, if not specified in the request.

The Creditor BIC is uniquely linked to exactly one wallet via the main flag (see PONTES.UR.06.120.1B). In case of direct settlement in T2 RTGS, the Credit BIC is used to determine the RTGS DCA in T2 RTGS to be credited.

ID	PONTES.UR.04.090.1B
Name	Derivation of wallet on the debtor side
Requirement	Pontes shall identify for each transaction the wallet to debit. Pontes shall determine the wallet from the Debtor BIC, if not specified in the request.

The Debtor BIC is uniquely linked to exactly one wallet via the main flag (see PONTES.UR.06.120.1B). In case of direct settlement in T2 RTGS, the Debtor BIC is used to determine the RTGS DCA in T2 RTGS to be debited.

ID	PONTES.UR.04.100.1B
Name	Detection of blocked wallet on the creditor side
Requirement	Pontes shall validate that the received transaction would not credit a wallet which is blocked.

Pontes rejects requests if the addressed wallet on the creditor side is blocked and informs the requestor accordingly. In case of direct settlement in T2 RTGS, Pontes rejects requests if the Participant on the creditor side is blocked and informs the requestor accordingly.

ID	PONTES.UR.04.110.1B
Name	Detection of blocked wallet on the debtor side
Requirement	Pontes shall validate that the received transaction would not debit a wallet which is blocked.

Pontes rejects requests if the addressed wallet on the debtor side is blocked and informs the requestor accordingly. In case of direct settlement in T2 RTGS, Pontes rejects requests if the Participant on the debtor side is blocked and informs the requestor accordingly.

ID	PONTES.UR.04.130
Name	Validation of the opening and closing dates of accounts
Requirement	Pontes shall validate that the opening date of both the Buyer and Seller wallets are equal to or less than the current Business date. Furthermore, Pontes shall validate that the closing date of both the Buyer and Seller wallets are equal or greater than the current business date.

Pontes rejects the transaction if at least one of the two accounts fails to fulfil the aforementioned conditions.

ID	PONTES.UR.04.140
Name	DvP Instance Creation
Requirement	Upon successful validation of the DvP Initialisation, Pontes shall create a new DvP instance.

Pontes shall generate an ID, an Execution Key and a Cancellation Key, and their respective hashes, for the initialised DvP instance. The keys shall be stored in a secure way, ensuring data replication, and disclosed only in line with the rules defined in this document. Pontes shall be able to manage a timeout for the initialised DvP, based on the time in which the DvP has been initialised and a system parameter which defines the timeout for DvP transactions. The DvP instance status is initialised as Created. Finally, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.190.1B.

4.2.1.2 (DvP) Initialisation Query

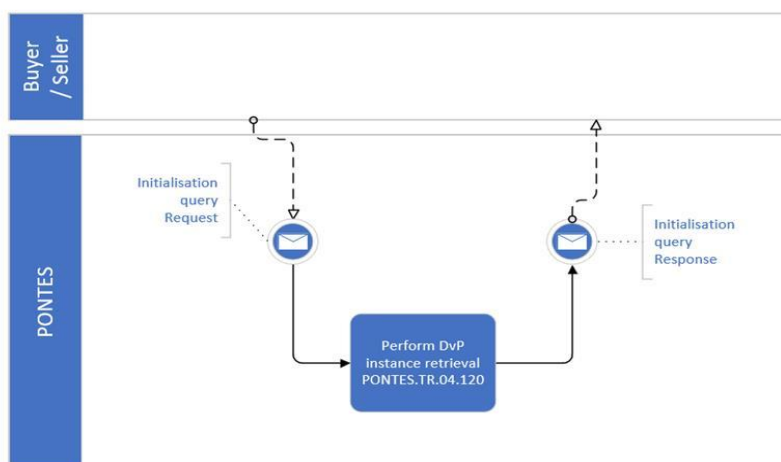


Figure 4.5 – (DvP) Initialisation Query Process Diagram

Table 4.5: List of tasks for the (DvP) Initialisation Query processing workflow

Task	Description
PONTES.TR.04.120	Retrieval of specific DvP instance data to be forwarded to the requestor.

ID	PONTES.UR.04.150
Name	(DvP) Initialisation Query - Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming (DvP) Initialisation Query request.

Pontes shall validate the request and notify the requestor in case a validation error occurred. The performed validations are, at least, the ones defined in PONTES.UR.04.160 and PONTES.UR.04.170. Moreover, all the rules defined in chapter 4.5 apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.210.1B.

ID	PONTES.UR.04.160
Name	(DvP) Initialisation Query – Participant and Market DLT Operator functional equivalence
Requirement	Pontes shall enable the functional equivalence between Participant and Market DLT Operator when sending an (DvP) Initialisation Query

Pontes shall accept (DvP) Initialisation Query requests for a DvP instance:

- (in case the requestor is the Seller) from a Participant even if the DvP instance has been initialised by a Market DLT Operator instructing on behalf of the Participant.
- (in case the requestor is the Seller) from a Market DLT Operator even if the DvP instance has been initialised by a Participant which specified the Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform.
- (in case the requestor is the Buyer) from the Participant owning the wallet to be debited or a Market DLT Operator that can instruct on behalf of that Participant.

ID	PONTES.UR.04.170
Name	(DvP) Initialisation Query – Multiple Requests
Requirement	Pontes shall allow an (DvP) Initialisation Query to be submitted multiple times for a single DvP instance.

Pontes shall process and respond to each (DvP) Initialisation Query independently, regardless of the number of prior submissions for the same DvP instance.

ID	PONTES.UR.04.180
Name	(DvP) Initialisation Query – Instance Retrieval
Requirement	Pontes shall retrieve the information related to the DvP instance requested.

Based on the information in the received (DvP) Initialisation Query request, Pontes shall retrieve the relevant initialised DvP instance, if it exists. Finally, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.230.1B.

4.2.1.3 DvP Payment

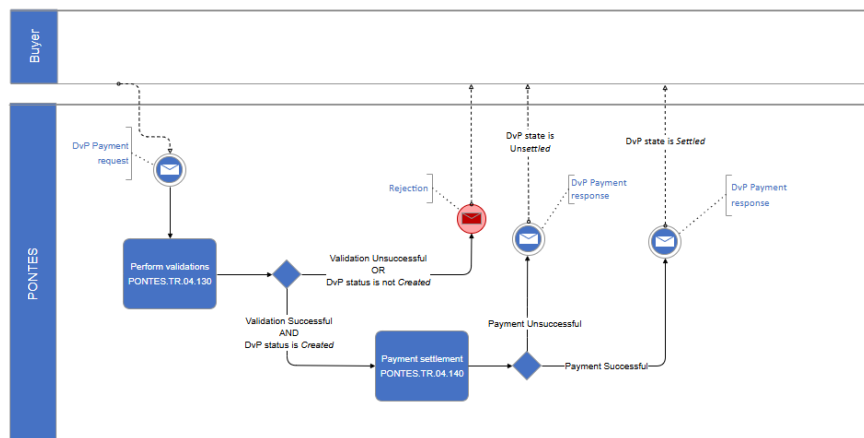


Figure 4.6 – DvP Payment Process Diagram: tokenised CeBM on Eurosystem DLT

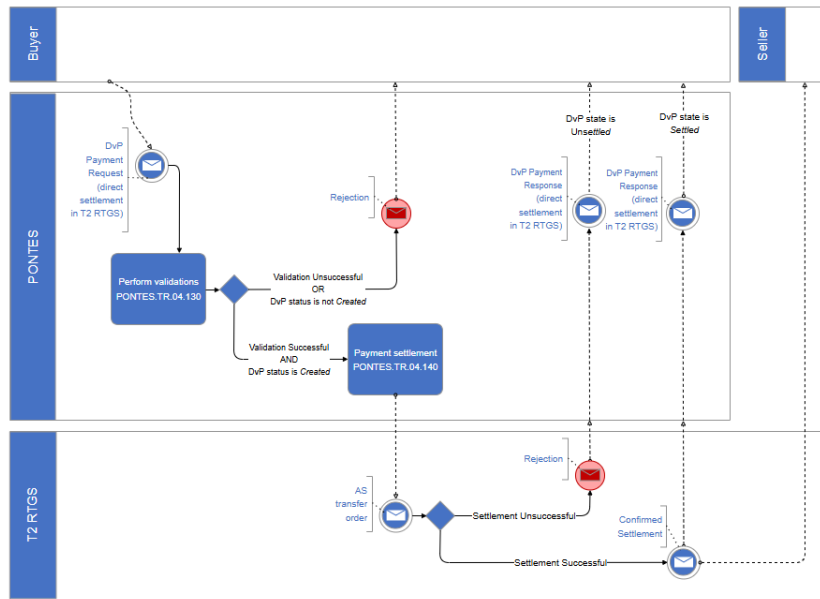


Figure 4.6B – DvP Payment Process Diagram: direct settlement in T2 RTGS

Table 4.6: List of tasks for the DvP Payment processing workflow

Task	Description
PONTES.TR.04.130	Execution of technical and business validations; if the DvP payment request received is rejected, the Buyer will receive an error response.
PONTES.TR.04.140	Upon successful completion of PONTES.TR.04.130, the DvP payment transaction is forwarded for settlement in accordance with the selected settlement model (on the Eurosystem DLT or with direct settlement in T2 RTGS via Ancillary System Settlement Procedure E).

ID	PONTES.UR.04.190
Name	DvP Payment - Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming DvP Payment request.

Pontes shall validate the request and notify the requestor in case a validation error occurred¹⁹. The performed validations are, at least, the ones defined in PONTES.UR.04.080.1B, PONTES.UR.04.090.1B, PONTES.UR.04.100.1B, PONTES.UR.04.110.1B, PONTES.UR.04.130, PONTES.UR.04.200, PONTES.UR.04.210. Moreover, all the rules defined in chapter 4.5 apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.240.1B.

¹⁹ In case of a successful validation, payment settlement is attempted according to PONTES.TR.04.140. The requestor receives a response after the processing of the task.

ID	PONTES.UR.04.200
Name	DvP Payment – Participant and Market DLT Operator functional equivalence
Requirement	Pontes shall enable the functional equivalence between Participant and Market DLT Operator when sending a DvP Payment request.

Pontes shall accept DvP Payment requests for a DvP instance from a Market DLT Operator even if the DvP instance has been initialised by a Participant which specified the Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform.

ID	PONTES.UR.04.210
Name	DvP Payment – DvP instance status
Requirement	Pontes shall validate that DvP Payment request is sent for DvP instance in the correct status.

When validating a DvP Payment request, Pontes shall check, at least, that:

- the DvP instance exists,
- the DvP instance is in status Created,
- the DvP instance information match the data in the DvP Payment request,
- the timeout related to the DvP instance has not yet expired.

In case DvP instance exists, it is in status Created, its timeout has not yet expired but the information does not match the data in the DvP Payment request, Pontes shall reject the request with no update on the DvP instance status.

ID	PONTES.UR.04.220.1B
Name	DvP Payment – funds availability in DCW
Requirement	Pontes shall validate the availability of funds in the DCW to settle a DvP Payment.

In case of settlement with tokenised CeBM on the Eurosystem DLT, Pontes shall ensure that the wallet to be debited is not blocked and has sufficient funds to cover the full amount of the DvP Payment request. If sufficient funds are not available, the settlement attempt shall be rejected in its entirety, and no partial settlement shall occur. In the event of rejection, Pontes shall set the status of the DvP instance to Unsettled.

ID	PONTES.UR.04.230.1B
Name	DvP Payment – settlement in tokenised CeBM
Requirement	Upon successful validation of the DvP Payment request, Pontes shall settle the DvP Payment on the Eurosystem DLT.

In case of settlement with tokenised CeBM on the Eurosystem DLT, Pontes shall settle the full amount as specified in the request debiting and crediting the relevant Participants' DCWs. The DvP instance status is updated to Settled. Finally, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.250.1B.

ID	PONTES.UR.04.560.2
Name	DvP Payment – direct settlement in T2 RTGS
Requirement	Upon successful validation of the DvP Payment request, Pontes shall submit the AS transfer order ²⁰ to T2 RTGS for execution.

In case of direct settlement in T2 RTGS, Pontes shall submit an AS transfer order to T2 RTGS (see Ancillary System Settlement Procedure E) via the T2 interface.

The AS transfer order shall result in T2 RTGS with debiting and crediting the relevant Participants' RTGS DCAs.

The T2 interface shall receive the settlement outcome from T2 RTGS and update the DvP instance status accordingly.

Pontes shall settle for the full amount as specified in the request. The DvP instance status is updated to Settled. Finally, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.250.1B.

4.2.1.4 (DvP) Get Key and Payment Information (Execution)

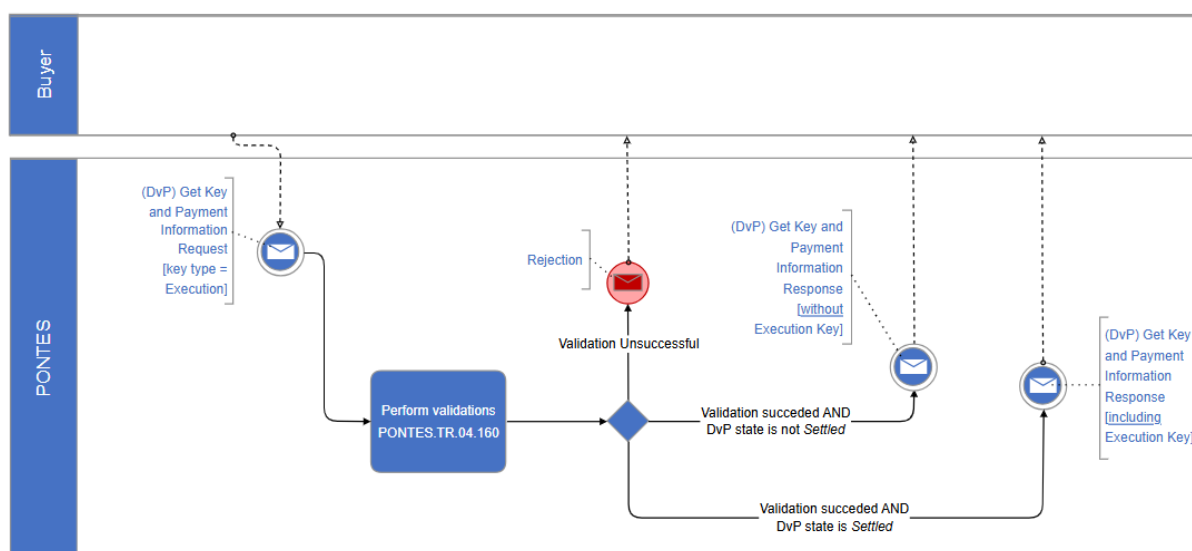


Figure 4.7 – (DvP) Get Key and Payment Information (Execution) Process Diagram

²⁰ Additional information can be found in the [T2 RTGS User Detailed Functional Specification \(UDFS\)](#) – see 5.2 Cash transfer orders and cash transfers in RTGS

Table 4.7: List of tasks for the (DvP) Get Key and Payment Information (Execution) processing workflow

Task	Description
PONTES.TR.04.160	Execution of technical and business validations; if the DvP status is Settled and the validations are successful the Buyer will receive the secret key (Execution Key) that can be used to force the transfer of the ownership of the asset on the Market DLT. Otherwise, it will receive a response without the secret key (Execution Key).

ID	PONTES.UR.04.240.1B
Name	(DvP) Get Key and Payment Information (Execution) - Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming (DvP) Get Key and Payment Information (Execution) request.

Pontes shall validate the request and notify the requestor in case a validation error occurred. The performed validations are, at least, the ones defined in PONTES.UR.04.250.1B, PONTES.UR.04.260.1B, PONTES.UR.04.270.1B, PONTES.UR.04.280.1B. Moreover, all the rules defined in chapter 4.5 apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.200.1B.

ID	PONTES.UR.04.250.1B
Name	(DvP) Get Key and Payment Information (Execution) – Identification
Requirement	Pontes shall identify that a (DvP) Get Key and Payment Information request refers to the Execution Key, on the basis of a parameter in the request.

ID	PONTES.UR.04.260.1B
Name	(DvP) Get Key and Payment Information (Execution) – Participant and Market DLT Operator functional equivalence
Requirement	Pontes shall enable the functional equivalence between Participant and Market DLT Operator when sending a (DvP) Get Key and Payment Information (Execution).

Pontes shall accept (DvP) Get Key and Payment Information (Execution) requests for a DvP instance:

- From a Participant (acting as Buyer in the DvP transaction) even if the DvP instance has been initialised (and/or settled) by a Market DLT Operator instructing on behalf of the Participant
- From a Market DLT Operator even if the DvP instance has been initialised (and/or settled) by a Participant which specified the Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform.

ID	PONTES.UR.04.270.1B
Name	(DvP) Get Key and Payment Information (Execution) – DvP instance status
Requirement	Pontes shall validate that (DvP) Get Key and Payment Information (Execution) is sent for DvP instance in the correct status.

When validating a (DvP) Get Key and Payment Information (Execution) request, Pontes shall check, at least, that:

- the DvP instance exists.

ID	PONTES.UR.04.280.1B
Name	(DvP) Get Key and Payment Information (Execution) – Multiple Requests
Requirement	Pontes shall allow a (DvP) Get Key and Payment Information (Execution) to be submitted multiple times for a single DvP instance.

Pontes shall process and respond to each (DvP) Get Key and Payment Information (Execution) independently, regardless of the number of prior submissions for the same DvP instance.

ID	PONTES.UR.04.290.1B
Name	(DvP) Get Key and Payment Information (Execution) – Execution Key disclosure
Requirement	Upon successful validation of the (DvP) Get Key and Payment Information (Execution) request, Pontes shall disclose the Execution Key.

Upon successful validation of the (DvP) Get Key and Payment Information (Execution) request, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.210.1B. The response shall contain the Execution Key if the DvP instance is in status Settled.

4.2.1.5 (DvP) Get Key and Payment Information (Cancellation)

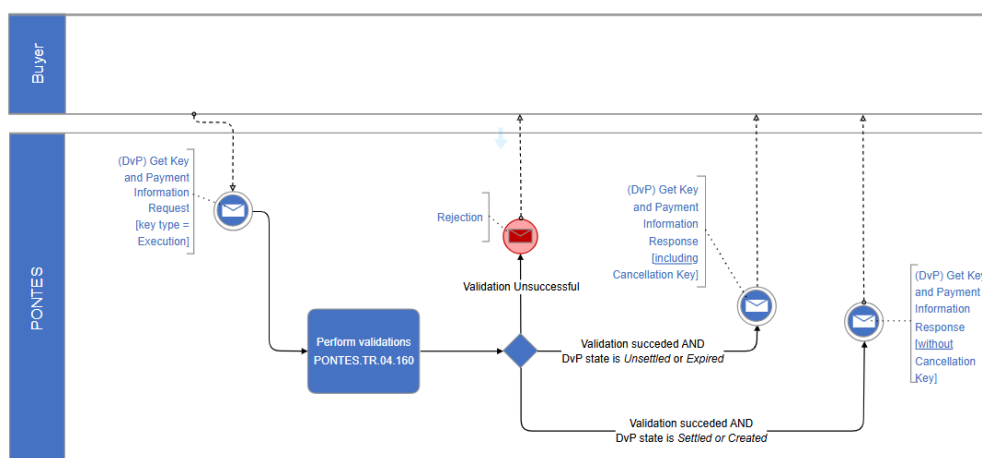


Figure 4.8 – (DvP) Get Key and Payment Information (Cancellation) Process Diagram

Table 4.8: List of tasks for the (DvP) Get Key and Payment Information (Cancellation) processing workflow

Task	Description
PONTES.TR.04.170	Execution of technical and business validations; if the DvP status is Expired (or Unsettled) and the validations are successful the Seller will receive the secret key (Cancellation Key) to unlock the asset on the asset DLT. Otherwise, it will receive a response without the secret key (Cancellation Key).

ID	PONTES.UR.04.300.1B
Name	(DvP) Get Key and Payment Information (Cancellation) - Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming (DvP) Get Key and Payment Information (Cancellation) request.

Pontes shall validate the request and notify the requestor in case a validation error occurred. The performed validations are, at least, the ones defined in PONTES.UR.04.300.1B, PONTES.UR.04.310.1B, PONTES.UR.04.320.1B, PONTES.UR.04.330.1B. Moreover, all the rules defined in chapter 4.5 apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.200.1B.

ID	PONTES.UR.04.310.1B
Name	(DvP) Get Key and Payment Information (Cancellation) – Identification
Requirement	Pontes shall identify that a (DvP) Get Key and Payment Information request refers to the Cancellation Key, on the basis of a parameter in the request.

ID	PONTES.UR.04.320.1B
Name	(DvP) Get Key and Payment Information (Cancellation) – Participant and Market DLT Operator functional equivalence
Requirement	Pontes shall enable the functional equivalence between Participant and Market DLT Operator when sending a (DvP) Get Key and Payment Information (Cancellation).

Pontes shall accept (DvP) Get Key and Payment Information (Cancellation) requests for a DvP instance:

- From a Participant (acting as Seller in the DvP transaction) even if the DvP instance has been initialised by a Market DLT Operator instructing on behalf of the Participant
- From a Market DLT Operator even if the DvP instance has been initialised by a Participant which specified the Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform.

ID	PONTES.UR.04.330.1B
Name	(DvP) Get Key and Payment Information (Cancellation) – DvP instance status
Requirement	Pontes shall validate that (DvP) Get Key and Payment Information (Cancellation) is sent for DvP instance in the correct status.

When validating a (DvP) Get Key and Payment Information (Cancellation) request, Pontes shall check, at least, that:

- the DvP instance exists.

ID	PONTES.UR.04.340.1B
Name	(DvP) Get Key and Payment Information (Cancellation) – Multiple Requests
Requirement	Pontes shall allow a (DvP) Get Key and Payment Information (Cancellation) to be submitted multiple times for a single DvP instance.

Pontes shall process and respond to each (DvP) Get Key and Payment Information (Cancellation) independently, regardless of the number of prior submissions for the same DvP instance.

ID	PONTES.UR.04.350.1B
Name	(DvP) Get Key and Payment Information (Cancellation) – Cancellation Key disclosure
Requirement	Upon successful validation of the (DvP) Get Key and Payment Information (Cancellation) request, Pontes shall disclose the Cancellation Key.

Upon successful validation of the (DvP) Get Key and Payment Information (Cancellation) request, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.210.1B. The response shall contain the Cancellation Key if the DvP instance is in status Expired or Unsettled.

4.2.1.6 DvP Lifecycle

ID	PONTES.UR.04.360.1B
Name	DvP Lifecycle Management
Requirement	Pontes shall manage the lifecycle of a DvP transaction in accordance with the stages described in the diagram below ²¹ . In case of DvP failure (e.g. because of lack of funds), the DvP instance is Unsettled, and a new DvP instance shall be initialised by the requestor.

²¹ The DvP lifecycle will be further elaborated in the User Detailed Functional Specifications (UDFS).

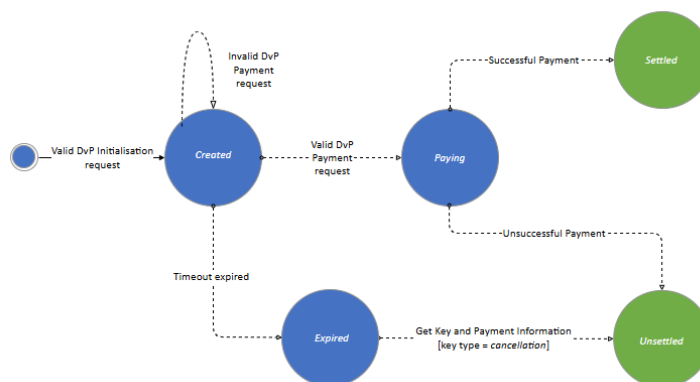


Figure 4.9 – DvP Status Diagram

4.2.2 Payment-versus-Payment

ID	PONTES.UR.04.370.1B
Name	Payment-versus-Payment (PvP)
Requirement	Pontes shall enable settlement of PvP transactions in tokenised CeBM where one payment leg is settled on the Eurosystem DLT, or in CeBM where the payment leg is settled directly in T2 RTGS. The other payment leg is settled on the relevant Market DLT Platform.

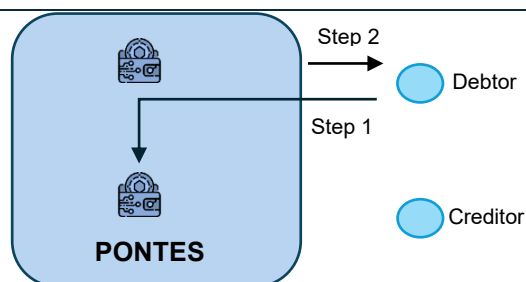
Pontes shall enable PvP transactions in line with the requirements for DvP transactions, as defined in chapter 4.2.1. The requests and responses for PvP transactions are defined in chapter 9.3.3.

4.3 ONE LEG TRANSACTIONS

This chapter outlines the requirements for wallet-to-wallet payments and payments with direct settlement in T2 RTGS.

Figure 4.10 illustrates the workflow for a wallet-to-wallet payment in Pontes. The steps in the overall process are further detailed in the document. Exceptional cases, such as validation errors, are not depicted in the diagram, but mentioned in the explanations following the diagram.

Figure 4.10
Wallet-to-Wallet Payment



Step 1: The Debtor sends the Wallet-to-Wallet Payment request to Pontes. After successful validation (including availability of sufficient funds), Pontes settles the amount²².

Step 2: Pontes sends a response to the Debtor. In case the payment is settled, a successful response is returned. Otherwise, an error message is returned.

4.3.1 Wallet-to-wallet Payment

ID	PONTES.UR.04.380
Name	Wholesale payments
Requirement	Pontes shall enable settlement of wholesale payments in tokenised CeBM only where such payments arise in the context of eligible asset transactions (e.g. coupon payments, margin calls, etc.) or other automated wholesale payments.

In the context of Wallet-to-Wallet Payments, Pontes shall foresee operations listed in the following table.

²² The settlement shown in the picture refers to settlement with tokenised CeBM on the Eurosystem DLT. Depending on the chosen settlement model, the payment can happen in T2 RTGS.

Table 4.9: List of requests and responses for Wallet-to-Wallet payments

Operation	Request / Response	Description
Wallet-to-Wallet payment	Request	Sent from the Debtor to settle a Wallet-to-Wallet payment. This message is covered in chapter 9.3.4.
	Response	Response received by the Debtor with the status of the Wallet-to-Wallet payment. This message is covered in chapter 9.3.4.
	Rejection Response	A response sent by Pontes to the Debtor when Pontes failed to process the specific request due to, e.g. validation errors. This message is covered in chapter 9.3.4.

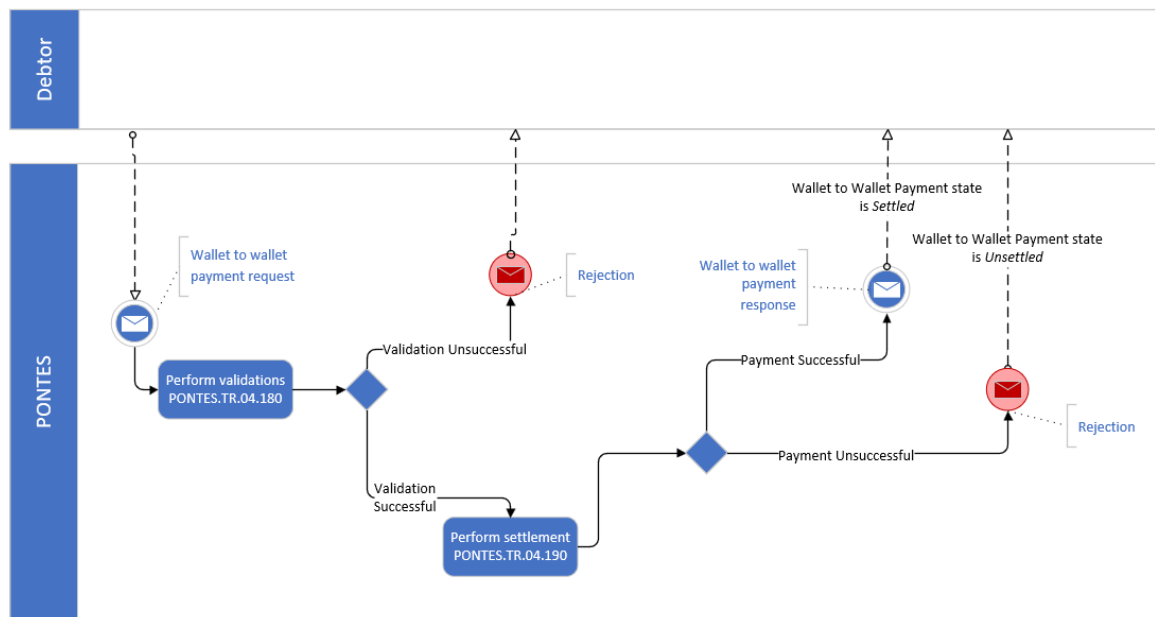


Figure 4.11 - Wallet to Wallet Payment Process

Table 4.10: List of tasks for the Wallet-to-Wallet Payment processing workflow

Task	Description
PONTES.TR.04.180	Execution of technical and business validations after the Debtor initiates a Wallet-to-Wallet payment; if the request is rejected, the Debtor will receive an error response.
PONTES.TR.04.190	Upon successful completion of PONTES.TR.04.180, the Wallet-to-Wallet payment is forwarded to the Eurosystem DLT for settlement.

ID	PONTES.UR.04.390
Name	Wallet-to-Wallet Payment - Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming Wallet-to-Wallet Payment request.

Pontes shall validate the request and notify the requestor in case a validation error occurred. The performed validations are, at least, the ones defined in PONTES.UR.04.080.1B, PONTES.UR.04.090.1B, PONTES.UR.04.100.1B, PONTES.UR.04.110.1B, PONTES.UR.04.130. Moreover, all the rules defined in chapter 4.5 apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.340.1B.

ID	PONTES.UR.04.400
Name	Wallet-to-Wallet Payment – funds availability
Requirement	Pontes shall validate the availability of funds to settle a Wallet-to-Wallet Payment.

Pontes shall ensure that the wallet to be debited has sufficient funds to cover the full amount of the Wallet-to-Wallet Payment request. If sufficient funds are not available, the request shall be rejected in its entirety, and no partial settlement shall occur.

ID	PONTES.UR.04.410
Name	Wallet-to-Wallet Payment – settlement
Requirement	Upon successful validation of the Wallet-to-Wallet Payment request, Pontes shall settle the Wallet-to-Wallet Payment.

Pontes shall settle for the full amount as specified in the request. The wallet-to-wallet payment status is updated to Settled. Finally, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.320.1B

4.3.1.1 Wallet-to-wallet payment Lifecycle

ID	PONTES.UR.04.420
Name	Wallet-to-Wallet Lifecycle Management
Requirement	Pontes shall manage the lifecycle of a Wallet-to-Wallet payment transaction in accordance with the stages described in the diagram below ²³ .

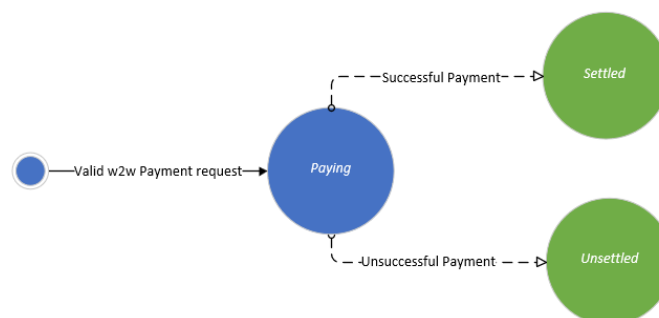


Figure 4.12 – Wallet-to-Wallet Status Diagram

4.3.2 Payments with direct settlement in T2 RTGS

ID	PONTES.UR.04.570.1A
Name	Payments with direct settlement in T2 RTGS
Requirement	Pontes shall enable direct settlement of wholesale payments in CeBM in T2 RTGS only where such payments arise in the context of eligible asset transactions (e.g. coupon payments, margin calls, etc.) or other automated wholesale payments.

In the context of payments with direct settlement in T2 RTGS, Pontes shall foresee operations listed in the following table.

²³ The Wallet-to-Wallet Payment lifecycle will be further elaborated in the User Detailed Functional Specifications (UDFS).

Table 4.9: List of requests and responses for payments with direct settlement in T2 RTGS

Operation	Request / Response	Description
Payment with direct settlement in T2 RTGS	Request	Sent from the Debtor to settle a payment with direct settlement in T2 RTGS. This message is covered in chapter 9.3.5.
	Response	Response received by the Debtor with the status of the payment with direct settlement in T2 RTGS. This message is covered in chapter 9.3.5.
	Rejection Response	A response sent by Pontes to the Debtor when Pontes failed to process the specific request due to, e.g. validation errors. This message is covered in chapter 9.3.5.

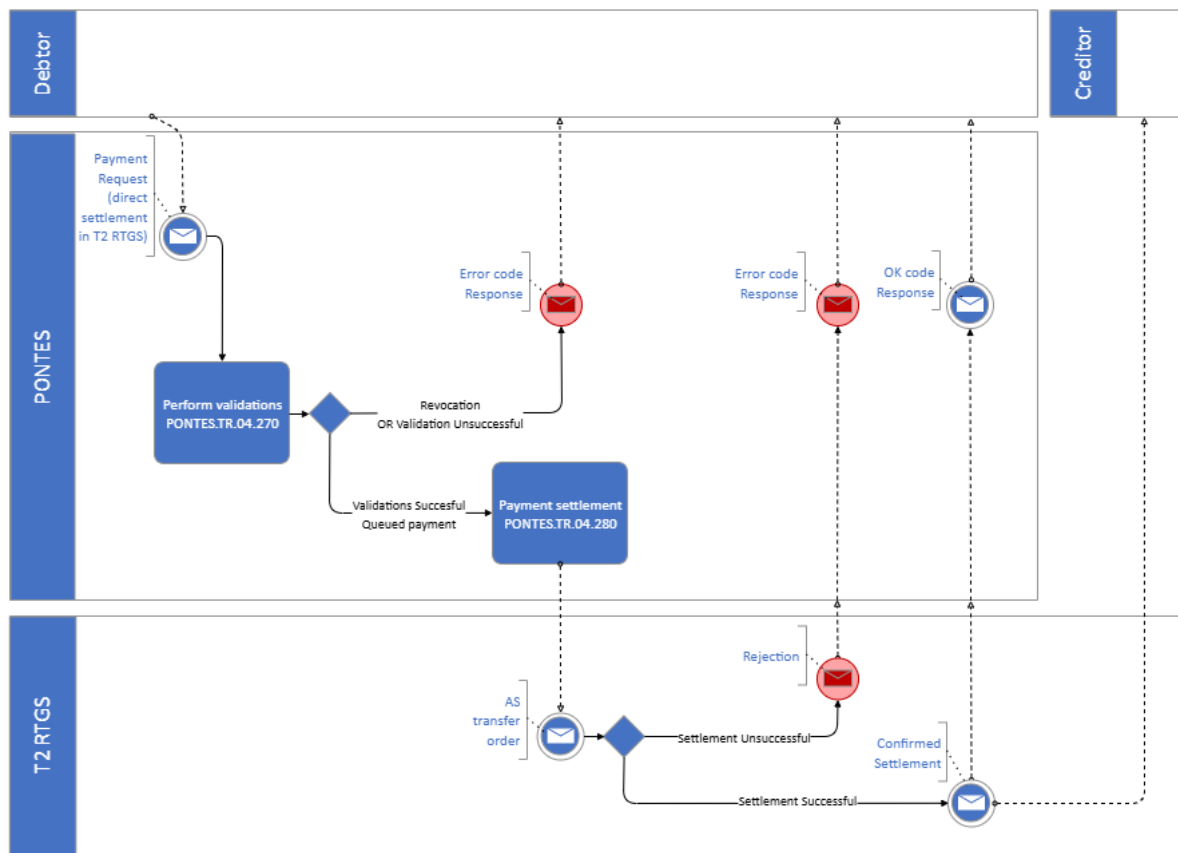


Figure 4.13 – Payment with direct settlement in T2 RTGS process

Table 4.10: List of tasks for the Payment with direct settlement in T2 RTGS processing workflow

Task	Description
PONTES.TR.04.270	Execution of technical and business validations after the Debtor initiates a payment with direct settlement in T2 RTGS; if the request is rejected, the Debtor will receive an error response.
PONTES.TR.04.280	Upon successful completion of PONTES.TR.04.270, the direct payment in RTGS is submitted for settlement to T2 RTGS via Ancillary System Settlement Procedure E.

ID	PONTES.UR.04.580.1A
Name	Payments with direct settlement in T2 RTGS – Technical and business validation
Requirement	Pontes shall perform technical and business validation of the incoming Payments with direct settlement in T2 RTGS request.

Pontes shall validate the request and notify the requestor in case a validation error occurs. The performed validations shall include, at a minimum, those defined in PONTES.UR.04.080.1B, PONTES.UR.04.090.1B, PONTES.UR.04.100.1B, PONTES.UR.04.110.1B. Moreover, all the rules defined in chapter 4.5 shall apply. Finally, Pontes shall validate that the received request is in line with PONTES.UR.09.440.1A.

ID	PONTES.UR.04.590.2
Name	Payments with direct settlement in T2 RTGS – Settlement
Requirement	Pontes shall process the settlement outcome of Payments with direct settlement in T2 RTGS requests submitted to T2 RTGS.

In case of direct settlement in T2 RTGS, Pontes shall submit an AS transfer order to T2 RTGS (see Ancillary System Settlement Procedure E) via the T2 interface.

The AS transfer order shall result in T2 RTGS with debiting and crediting the relevant Participants' RTGS DCAs. The T2 interface shall receive the settlement outcome from T2 RTGS and update the direct settlement in T2 RTGS instance status accordingly. Pontes shall settle for the full amount as specified in the request (no partial settlement shall occur). In case of success, the direct settlement in T2 RTGS instance status is updated to Settled. Otherwise, the status is updated to Unsettled.

Finally, Pontes shall return to the requestor a response which is in line with PONTES.UR.09.450.1A.

4.3.2.1 Direct Payment in T2 RTGS Lifecycle

ID	PONTES.UR.04.600.1A
Name	Payment with direct settlement in T2 RTGS Lifecycle Management
Requirement	Pontes shall manage the lifecycle of a payment with direct settlement in T2 RTGS transaction in accordance with the stages described in the diagram below ²⁴ .

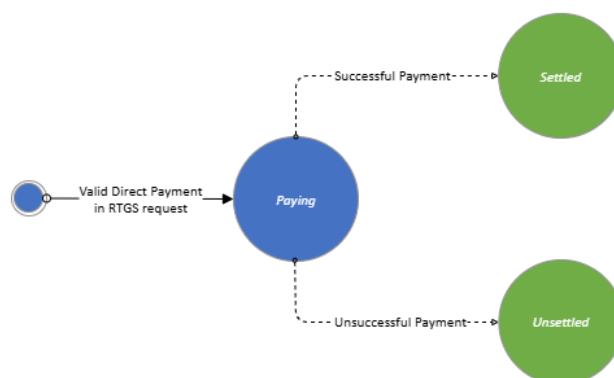


Figure 4.14 – Payment with direct settlement in T2 RTGS Status Diagram

4.4 PAYMENT FREE OF DELIVERY TRANSACTIONS

ID	PONTES.UR.04.610.1A
Name	Payment Free of Delivery (PFoD)
Requirement	Pontes shall enable settlement of PFoD transactions in tokenised CeBM.

In the context of PFoD transactions, Pontes shall foresee operations listed in the following table.

Table 4.11: List of requests and responses for PFoD processing

Operation	Request / Response	Description
PFoD Delivering Leg (DELI) Initialisation	Request	Sent from the Seller (Participant or a Market DLT Operator instructing on its behalf) to request the initiation of the PFoD Delivering “DELI” leg. For a successful PFoD to occur, the PFoD Delivering “DELI” leg should be created before the corresponding “RECE” leg.
	Response	Response received by the Seller (Participant or a Market DLT Operator instructing on its behalf) with the status of the relevant initialisation request.
PFoD Receiving Leg (RECE) Initialisation	Request	Sent from the Buyer (Participant or a Market DLT Operator instructing on its behalf) to request the initiation of the PFoD Receiving “RECE” leg. For a successful PFoD to occur, the “RECE” leg should be sent after the corresponding “DELI” leg.

²⁴ The Direct Payment in T2 RTGS lifecycle will be further elaborated in the User Detailed Functional Specifications (UDFS).

		Pontes then fetch the PFoD Delivering "DELI" leg's identifier and performs consistency checks against the "DELI" leg. If the identifier is found and the checks are consistent, then Pontes processes the PFoD settlement. Otherwise, the PFoD goes in error.
	Response	Response received by the Buyer (Participant or a Market DLT Operator instructing on its behalf) with the status of the relevant initialisation request.

4.4.1 PFoD Delivering Leg (DELI) Initialisation

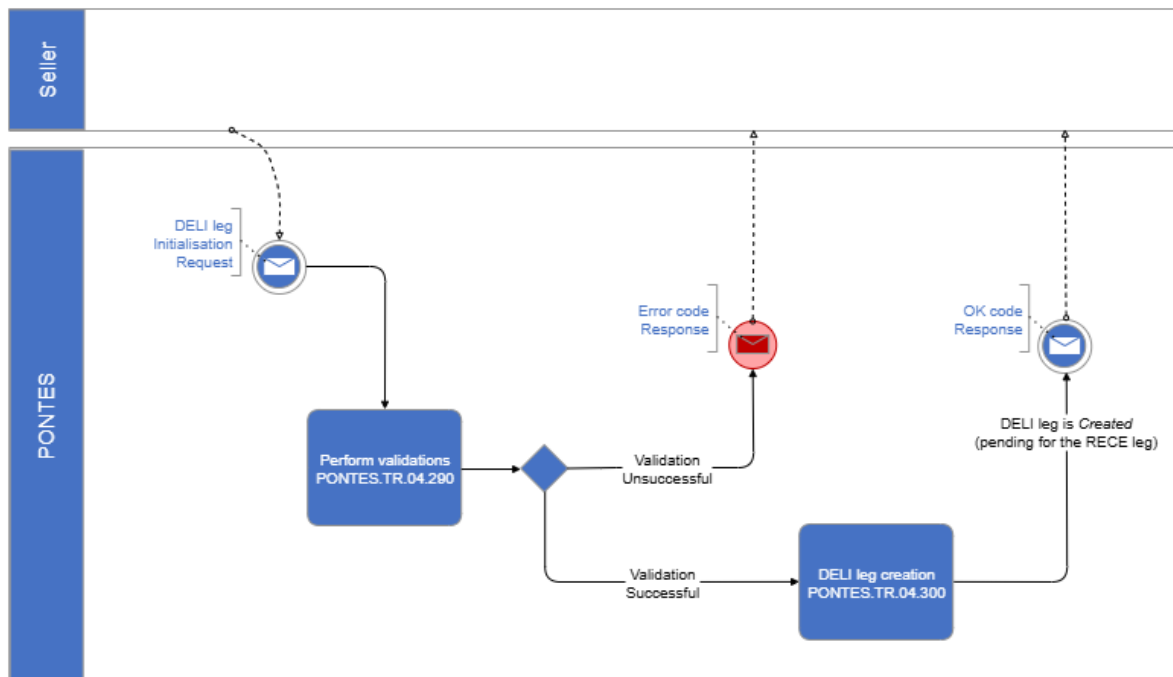


Figure 4.13 - PFoD Delivering Leg (DELI) Initialisation Process Diagram

Table 4.12: List of tasks for the DELI leg Initialisation processing workflow

Task	Description
PONTES.TR.04.290	Execution of technical and business validations after the Seller requests a DELI leg creation; if the leg initialisation request received is rejected, the Seller will receive an error response.
PONTES.TR.04.300	Upon successful completion of PONTES.TR.04.290, creation of the DELI leg into Pontes, configured with the data received from the Seller.

4.4.2 PFoD Receiving Leg (RECE) Initialisation

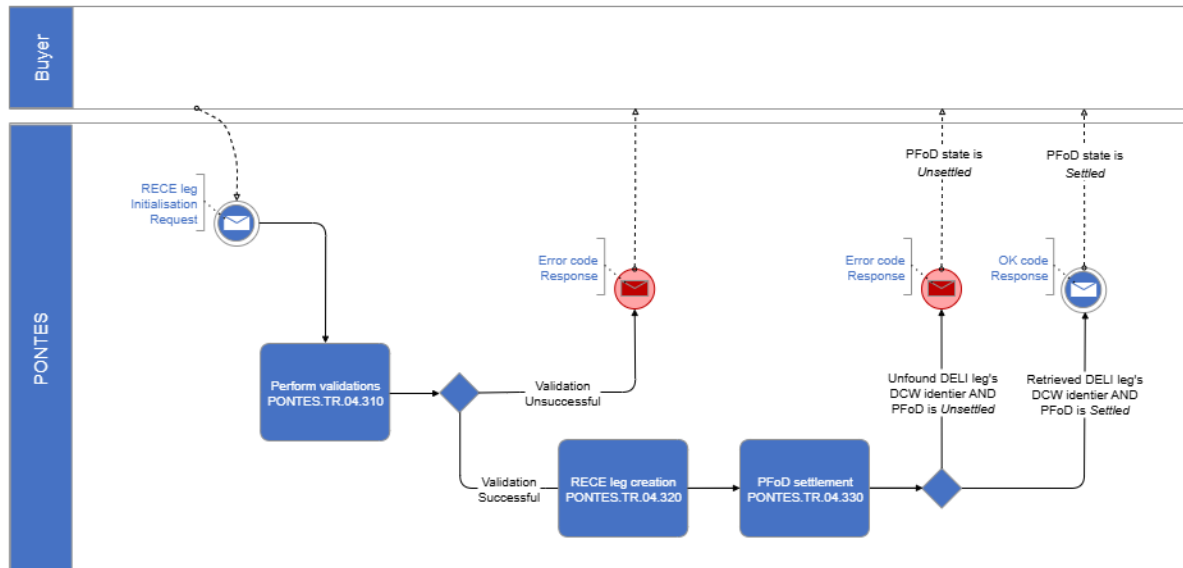


Figure 4.14 – PFoD Receiving Leg (RECE) Initialisation Process Diagram

Table 4.13: List of tasks for the RECE leg Initialisation processing workflow

Task	Description
PONTES.TR.04.310	Execution of technical and business validations after the Buyer requests a RECE leg creation; if the leg initialisation request received is rejected, the Buyer will receive an error response.
PONTES.TR.04.320	Upon successful completion of PONTES.TR.04.310, creation of the RECE leg into Pontes, configured with the data received from the Buyer.
PONTES.TR.04.330	Upon successful completion of PONTES.TR.04.320, settlement of the PFoD.

4.4.3 PFoD Lifecycle

ID	PONTES.UR.04.620.1A
Name	PFoD Lifecycle Management
Requirement	Pontes shall manage the lifecycle of a PFoD transaction in accordance with the stages described in the diagram below ²⁵ .

The PFoD Delivering "DELI" leg should be created first, else the PFoD Receiving "RECE" leg would run into an error. Once created, the PFoD Delivering "DELI" leg waits for the PFoD Receiving "RECE"

²⁵ PFoD lifecycle will be further elaborated in the User Detailed Functional Specifications (UDFS)

leg to be created (no timeout is foreseen for PFoD transactions). Hence, the PFoD Receiving "RECE" leg creation is the PFoD settlement's initiation.

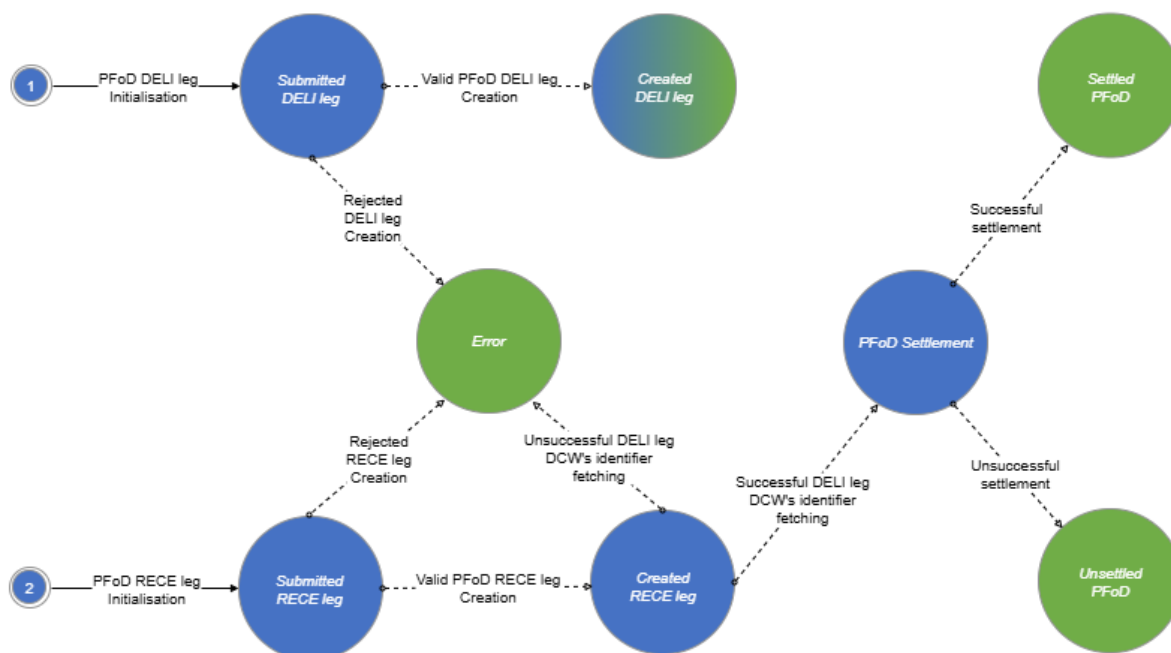


Figure 4.15 - PFoD Status Diagram

4.5 GENERAL REQUIREMENTS

ID	PONTES.UR.04.510.1B
Name	Technical and business validation
Requirement	Pontes shall perform technical and business validations of the incoming request. The business validation shall terminate when it encounters the first error.

Pontes validates an incoming request and reports an error in the response to the requestor in case a validation error occurred. The checks performed during the business validation are specified in this document for each request. In addition, technical validations are performed (e.g. the format of the received request is the expected one).

For requests related to direct settlement in T2 RTGS, Pontes shall only perform validation based on reference data managed locally (in each Central Bank's Local Reference Data Management component for their Participants). Validation of settlement conditions, including funds availability, shall be performed by T2 RTGS under Ancillary System Settlement Procedure E.

ID	PONTES.UR.04.520
Name	Authorisation to send a request
Requirement	Pontes shall validate that the party that sent a request is authorised to send it.

Pontes shall validate that the party that sent a request is authorised to do it, in line with the requirements defined in this document including PONTES.UR.06.490.1B, PONTES.UR.06.280.1B and PONTES.UR.06.630.1A.

ID	PONTES.UR.04.530
Name	Error response in case of a validation error
Requirement	Pontes shall inform the party sending the request with an error response in case a validation error occurred. The error response shall include a rejection reason code and optionally a description.

The error shall include at least a code and a description like in the standard error format for HTTP API (see [RFC 9457](#)).

5 LIQUIDITY MANAGEMENT

The objective of this chapter is to outline the Pontes liquidity management functionality providing a detailed overview of the transfer of liquidity from/to T2 RTGS to/from Pontes and between Pontes DCWs belonging to the same Participant.

In this context, liquidity management refers to:

- *Funding operations*, as an inbound liquidity transfers from the perspective of Pontes (as described in chapter 5.2)
- *Defunding operations*, as an outbound liquidity transfers from the perspective of Pontes (as described in chapter 5.3)
- *Intra service liquidity transfer operations*, to cover the wallet-to-wallet transfer (as described in chapter 5.4)
- *Mandatory End-of-Day defunding* (as described in chapter 5.6)

5.1 OVERVIEW

Pontes must support the funding and defunding from/to T2 RTGS allowing management of tokenised CeBM in Pontes DCWs. Funding and defunding result in the issuance or redemption of tokenised CeBM.

Furthermore, Pontes must support intra service liquidity transfers, between two wallets. Liquidity transfers between two DCWs are only possible if the two DCWs belong to the same Participant.

Pontes does not foresee rule-based liquidity transfers or standing orders liquidity transfers. All liquidity movements between the Eurosystem DLT and T2 RTGS shall be initiated by the Central Bank or Participant and executed as described in this document. Pontes shall submit the relevant instructions to T2 RTGS and process the settlement outcomes accordingly.

ID	PONTES.UR.05.010.1B
Name	Wholesale tokenised CeBM
Requirement	The service shall enable issuance and redemption of wholesale CeBM (wCeBM) in the form of DLT-based tokens.

ID	PONTES.UR.05.020.1B
Name	One Token Issuance Account in T2 RTGS and one Token Issuance Wallet in Pontes
Requirement	Pontes shall use a single Token Issuance Account in T2 RTGS and a single Token Issuance Wallet on the Eurosystem DLT to perform all funding and defunding operations.

Liquidity transfers between T2 RTGS and Pontes are performed via the Token Issuance Account in T2 RTGS and the Token Issuance Wallet on the Eurosystem DLT. These components support the issuance and redemption of tokenised CeBM. Both are owned by the ECB and operated by the Pontes Operator.

ID	PONTES.UR.05.040.1B
Name	No overnight tokenised liquidity
Requirement	Pontes shall enforce automatic mandatory end-of-day defunding, as described in chapter 5.6 and shall prevent overnight tokenised CeBM balance.

5.2 INBOUND LIQUIDITY TRANSFERS

In this context, inbound liquidity transfers refer to *funding operations* initiated by a Participant (or a Central Bank) during the Pontes business hours. A funding operation, as result of the automated process described in this chapter, debits the requestor's RTGS DCA in T2 RTGS of the specified amount of CeBM and credits the requestor's DCW on the Eurosystem DLT of the same amount of tokenised CeBM.

Figure 5.1 - Inbound Liquidity Transfer Process Diagram in Pontes

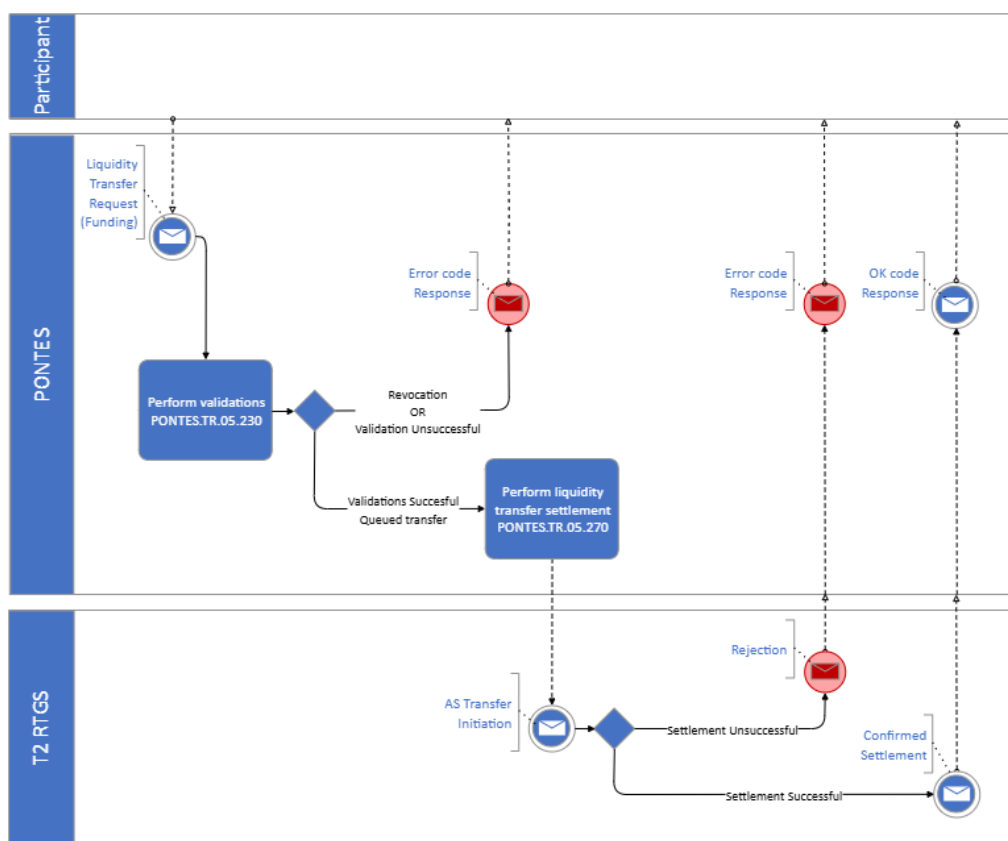


Table 5.1: List of requests and responses for inbound liquidity transfers processing in Pontes

Message	Request / Response	Description
Liquidity Transfer (funding)	Request	Sent by the Participant to Pontes, contains information about the wallet to be credited and the amount. This message is covered in chapter 9.3.7.
	Response	Sent by Pontes to the Participant, can entail a negative receipt message in case an error occurred (e.g. unsuccessful validation in Pontes) or a positive receipt otherwise. This message is covered in chapter 9.3.7.
AS Transfer Initiation	ISO message	Request: Sent by Pontes to T2 RTGS. Contains the information required to debit the Participant's RTGS DCA and to credit the same amount to the ECB RTGS DCA referred to as the 'Token Issuance Account'. This message is covered in T2 RTGS User Detailed Functional Specification (UDFS).
AS Transfer Initiation Status	ISO message	Response: Sent by T2 RTGS to Pontes indicating the outcome of the AS transfer order. It may indicate successful settlement or rejection (e.g. due to validation or liquidity constraints). This message is covered in T2 RTGS User Detailed Functional Specification (UDFS).

Table 5.2: List of tasks for the inbound liquidity transfers processing workflow in Pontes

Task	Description
PONTES.TR.05.230	Execution of technical and business validations; the inbound liquidity transfer is rejected as soon as one validation fails. This task is covered in chapter 5.6.1.
PONTES.TR.05.270	Execution of the liquidity transfer by submitting the corresponding instruction to T2 RTGS under Ancillary System Settlement Procedure E to debit the Participant's RTGS DCA and to credit the same amount to the ECB RTGS DCA referred to as the 'Token Issuance Account'. Pontes shall process the settlement outcome returned by T2 RTGS and, upon confirmation of the successful settlement in T2 RTGS, debit tokenised CeBM from the ECB's Token Issuance Wallet and credit the respective amount to the Participants' DCW.

5.3 OUTBOUND LIQUIDITY TRANSFERS

In this context, outbound liquidity transfers refer to *defunding operations* initiated by a Participant (or a Central Bank) during the Pontes business hours²⁶. A defunding operation, as result of the automated process described in this chapter, debits the requestor's DCW on the Eurosystem DLT of the specified amount of tokenised CeBM and credits the requestor's RTGS DCA in T2 RTGS of the same amount of CeBM.

²⁶ The mandatory and automated defunding of all tokenised CeBM balances at the end of each Pontes business day is described in chapter 5.6.

Figure 5.2 - Outbound Liquidity Transfer process in Pontes

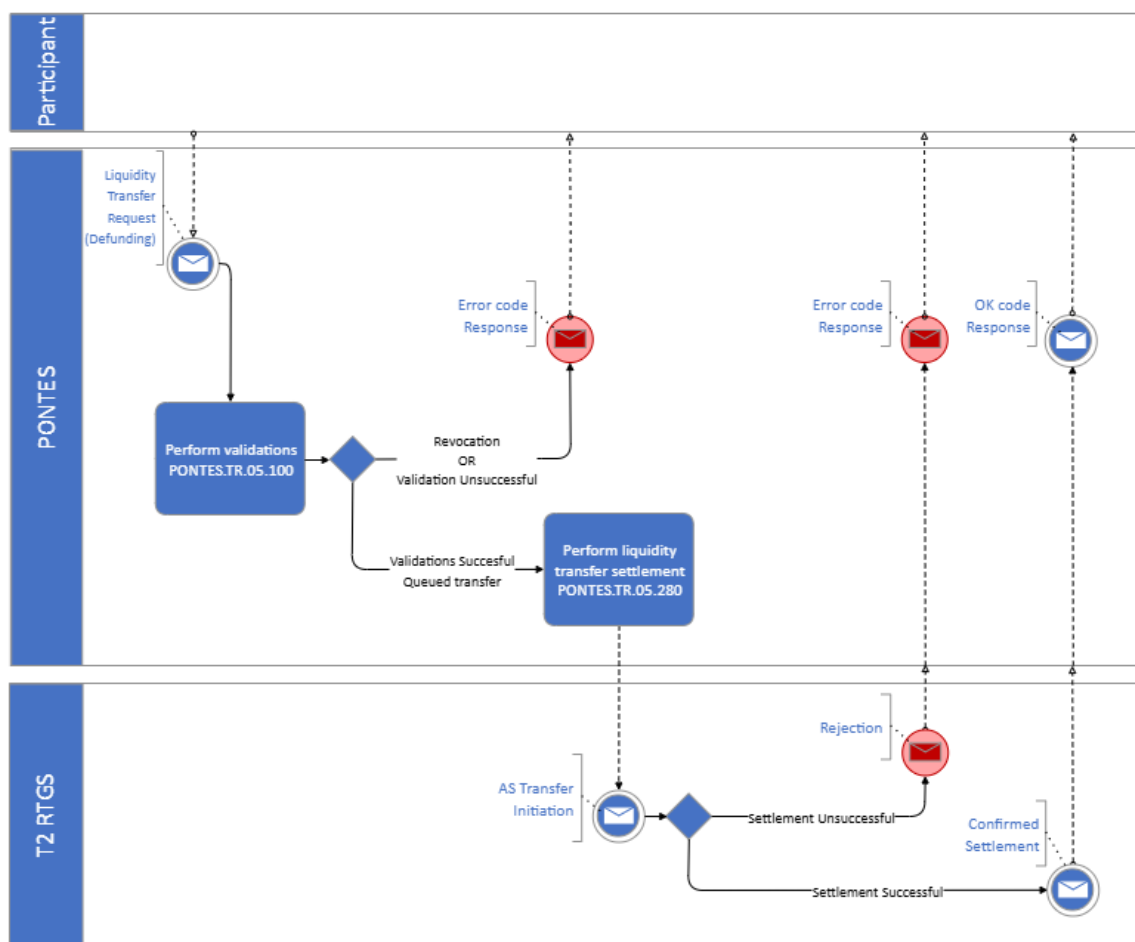


Table 5.3: List of requests and responses for outbound liquidity transfers processing in Pontes

Message	Request / Response	Description
Liquidity Transfer (defunding)	Request	Sent by the Participant to Pontes, contains information about the wallet to be debited and the amount. This message is covered in chapter 9.3.7.
	Response	Sent by Pontes to the Participant, can entail a negative receipt message in case an error occurred (e.g. unsuccessful validation in Pontes) or a positive receipt otherwise. This message is covered in chapter 9.3.7.
AS Transfer Initiation	ISO message	Request: Sent by Pontes to T2 RTGS. Contains the information required to debit the ECB RTGS DCA referred to as the 'Token Issuance Account' and to credit the same amount to Participant's RTGS DCA. This message is covered in T2 RTGS User Detailed Functional Specification (UDFS).
AS Transfer Initiation Status	ISO message	Response: Sent by T2 RTGS to Pontes indicating the outcome of the AS transfer order. It may indicate successful settlement or rejection (e.g. due to validation or liquidity constraints). This message is covered in T2 RTGS User Detailed Functional Specification (UDFS).

Table 5.4: List of tasks for the outbound liquidity transfers processing workflow in Pontes

Task	Description
PONTES.TR.05.100	Execution of technical and business validations; the outbound liquidity transfer is rejected as soon as one validation fails. This task is covered in chapter 5.6.2.
PONTES.TR.05.280	Execution of the liquidity transfer by debiting tokenised CeBM from the Participants' DCW, crediting the same amount to the ECB's Token Issuance Wallet and submitting the corresponding instruction to T2 RTGS under Ancillary System Settlement Procedure E to debit the ECB RTGS DCA referred to as the 'Token Issuance Account' and to credit the same amount to the Participant's RTGS DCA. Pontes shall process the settlement outcome returned by T2 RTGS and reflect the outcome accordingly.

5.4 INTRA SERVICE LIQUIDITY TRANSFERS

In this context, intra service liquidity transfers refer to *wallet-to-wallet transfers* initiated by a Participant (or a Central Bank) during the Pontes business hours. A wallet-to-wallet transfers (only possible between two DCWs belonging to the requestor), as result of the automated process described in this chapter, debits a DCW on the Eurosystem DLT of the specified amount of tokenised CeBM and credits a DCW on the Eurosystem DLT of the same amount of tokenised CeBM.

Figure 5.3 – Intra service Liquidity Transfer Process Diagram in Pontes

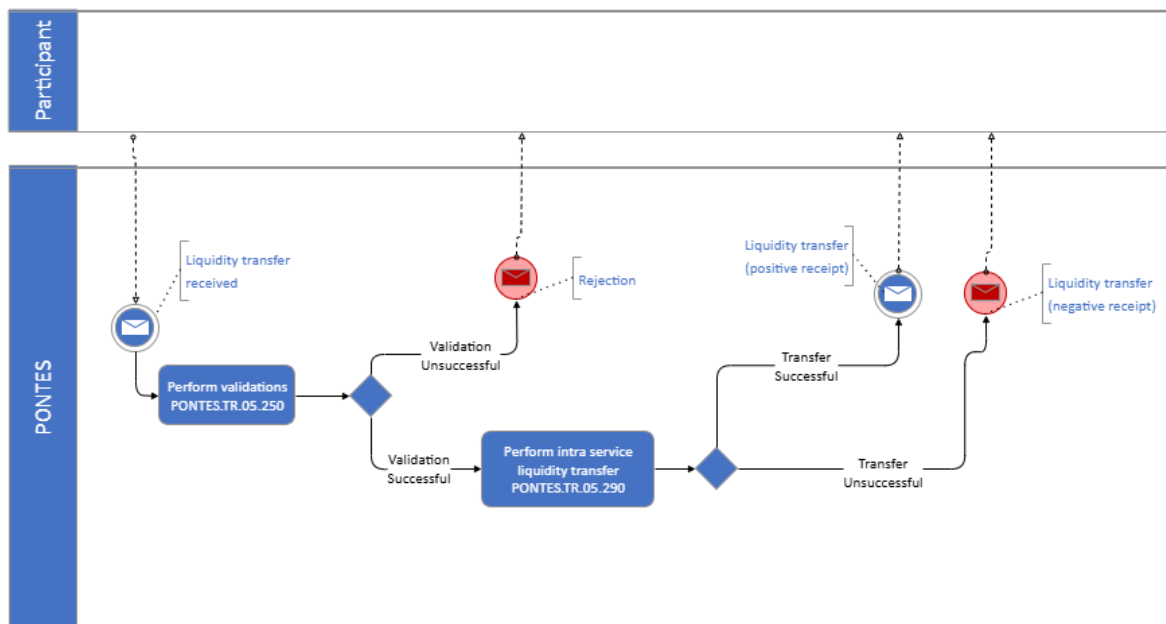


Table 5.5: List of requests and responses for intra service liquidity transfers processing in Pontes

Message	Request / Response	Description
Liquidity Transfer (wallet-to-wallet transfer)	Request	Sent by the Participant to Pontes, contains the information required to execute a liquidity transfer between two DCWs, including the wallets (both belonging to the same Participant) Ato be debited and credited and the amount. This message is covered in chapter 9.3.7.
	Response	Sent by Pontes to the Participant indicating the outcome of the liquidity transfer request. It may indicate rejection (e.g. due to validation failure) or successful execution. This message is covered in chapter 9.3.7.

Table 5.6: List of tasks for intra service liquidity transfers processing workflow in Pontes

Task	Description
PONTES.TR.05.250	Execution of technical and business validations; the intra service liquidity transfer is rejected as soon as one validation fails.
PONTES.TR.05.290	Execution of the liquidity transfer. Pontes shall debit the DCW to be debited and credit the DCW to be credited.

5.5 LIQUIDITY TRANSFER PROCESSING

5.5.1 Validation of Inbound Liquidity Transfers

ID	PONTES.UR.05.320.1A
Name	Authorisation to send inbound liquidity transfer
Requirement	Pontes shall validate that the requestor of a liquidity transfer is authorised to send an inbound liquidity transfer request. If not, Pontes shall reject the liquidity transfer and reflect the rejection in the response provided to the requestor.

Table 5.6B: Inbound liquidity transfers authorisation in Pontes

Actor	U2A (2-eyes)	U2A (4-eyes)	A2A (1-step)	A2A (2-steps)
Central Banks		✓		✓
Participants		✓		✓
Market DLT Operators				

ID	PONTES.UR.05.330.1A
Name	Mandatory fields for an inbound liquidity transfer request
Requirement	Pontes shall validate the mandatory attributes of an inbound liquidity transfer request. In case of a mandatory attributes error, Pontes shall reject the liquidity transfer and include the rejection in the response provided to the requestor.

ID	PONTES.UR.05.100.1B
Name	Validation of an inbound liquidity transfer
Requirement	Pontes shall validate the mandatory attributes of an inbound liquidity transfer request. In case of a mandatory attributes error, Pontes shall reject the liquidity transfer and include the rejection in the response provided to the requestor.

Pontes shall route the inbound liquidity transfer to the relevant Central Bank node.

Pontes shall use reference data managed locally (in each Central Bank's Local Reference Data Management component for their Participants) to validate the information included in the liquidity transfer message. Pontes shall check at least:

- the identifier of the wallet to credit in Pontes;
- the currency denomination of the wallet to credit in Pontes (Euro only);
- the status of the wallet to credit in Pontes.

Pontes shall check that (i) the wallet to credit is a valid wallet in Pontes (e.g., it exists and is open) and (ii) the wallet to credit is not blocked.

In case of a validation error, Pontes shall reject the liquidity transfer and notify the initiator of the request.

Moreover, Pontes shall use reference data managed locally (in each Central Bank's Local Reference Data Management component for their Participants) to derive the Participant's RTGS DCA in T2 RTGS to be debited in the process of inbound liquidity transfer (*funding*) based on the Participant Identifier (see PONTES.UR.06.610.1A).

ID	PONTES.UR.05.340.1A
Name	Inbound liquidity transfers initiated in Pontes
Requirement	Pontes shall allow the initiation of inbound liquidity transfers (via U2A and A2A), resulting in debiting Participants' RTGS DCAs in T2 RTGS and crediting Participants' DCWs in Pontes.

5.5.2 Validation of Outbound Liquidity Transfers

ID	PONTES.UR.05.120.1B
Name	Authorisation to send outbound liquidity transfer
Requirement	Pontes shall validate that the requestor of a liquidity transfer is authorised to send an outbound liquidity transfer request. If not, Pontes shall reject the liquidity transfer and reflect the rejection in the response provided to the requestor.

Table 5.7: Outbound liquidity transfers authorisation in Pontes

Actor	U2A (2-eyes)	U2A (4-eyes)	A2A (1-step)	A2A (2-steps)
Central Banks		✓		✓
Participants		✓		✓
Market DLT Operators				

ID	PONTES.UR.05.130.1B
Name	Mandatory fields for an outbound liquidity transfer request
Requirement	Pontes shall validate the mandatory attributes of an outbound liquidity transfer request. In case of a mandatory attributes error, Pontes shall reject the liquidity transfer and include the rejection in the response provided to the requestor.

ID	PONTES.UR.05.140.1B
Name	Validation of an outbound liquidity transfer
Requirement	Pontes shall validate that information contained in the outbound liquidity transfer request is consistent with the data available in Pontes.

Pontes shall route the outbound liquidity transfer to the relevant Central Bank node.

Pontes shall use reference data managed locally (in each Central Bank's Local Reference Data Management component for their Participants) to validate the information included in the liquidity transfer message. Pontes shall check at least:

- the identifier of the wallet to debit in Pontes;
- the currency denomination of the wallet to debit in Pontes (Euro only);
- the status of the wallet to debit in Pontes.

Pontes shall check that (i) the wallet to debit is a valid wallet in Pontes (e.g., it exists and is open) and (ii) the wallet to debit is not blocked.

In case of a validation error, Pontes shall reject the liquidity transfer and notify the initiator of the request.

Moreover, Pontes shall use reference data managed locally (in each Central Bank's Local Reference Data Management component for their Participants) to derive the Participant's RTGS DCA in T2 RTGS to be credited in the process of outbound liquidity transfer (*defunding*) based on the Participant Identifier (see PONTES.UR.06.610.1A).

ID	PONTES.UR.05.150
Name	Rejection of an outbound liquidity transfer due to insufficient funds
Requirement	Pontes shall reject an outbound liquidity transfer whose amount would decrease the balance of the wallet to debit below zero.

Pontes shall settle liquidity transfers on wallets for the full amount. If the DCW to debit does not have sufficient funds, the liquidity transfer is rejected and not settled partially.

ID	PONTES.UR.05.170.1B
Name	Outbound liquidity transfers initiated in Pontes
Requirement	Pontes shall allow the initiation of outbound liquidity transfers (via U2A and A2A), resulting debiting Participants' DCWs in Pontes and crediting Participants' RTGS DCAs in T2 RTGS.

5.5.3 Validation of Intra service Liquidity Transfer

ID	PONTES.UR.05.180.1B
Name	Authorisation to send intra service liquidity transfer
Requirement	Pontes shall validate that the requestor of a liquidity transfer is authorised to send an intra service liquidity transfer request. If not, Pontes shall reject the liquidity transfer and reflect the rejection in the response provided to the requestor.

Table 5.8: Intra service liquidity transfers authorisation in Pontes

Actor	U2A (2-eyes)	U2A (4-eyes)	A2A (1-step)	A2A (2-steps)
Central Banks		✓		✓
Participants		✓		✓
Market DLT Operators				

ID	PONTES.UR.05.190
Name	Mandatory fields for an intra service liquidity transfer request
Requirement	Pontes shall validate the mandatory attributes of an intra service liquidity transfer request. In case of a mandatory attributes error, Pontes shall reject the liquidity transfer and reflect the rejection in the response provided to the requestor.

Pontes shall validate that the received Liquidity Transfer request is in line the liquidity transfer messaging and validation rules.

ID	PONTES.UR.05.200.1B
Name	Validation of an intra service liquidity transfer
Requirement	Pontes shall validate that information contained in the intra service liquidity transfer request is consistent with the data available in Pontes.

Pontes shall route the intra service liquidity transfer to the relevant Central Bank node.

Pontes shall use reference data managed locally (in each Central Bank's Local Reference Data Management component for their Participants) to validate the information included in the liquidity transfer message. Pontes shall check at least:

- the identifier of the wallet to debit in Pontes;
- the currency denomination of the wallet to debit in Pontes (Euro only);
- the status of the wallet to debit in Pontes;
- the identifier of the wallet to credit in Pontes;
- the currency denomination of the wallet to credit in Pontes (Euro only);
- the status of the wallet to credit in Pontes.

Pontes shall check that (i) the wallet to debit and the wallet to credit are valid wallets in Pontes (e.g., they exist and are open) and (ii) the wallet to debit and the wallet to credit are not blocked.

In case a validation error occurs, Pontes shall reject the liquidity transfer and reflect the rejection in the response provided to the requestor.

ID	PONTES.UR.05.210
Name	Rejection of an intra service liquidity transfer due to insufficient funds
Requirement	Pontes shall reject an intra service liquidity transfer whose amount would decrease the balance of the wallet to debit below zero.

Pontes shall settle liquidity transfers on wallets for the full amount. If the DCW to debit does not have sufficient funds, the liquidity transfer is rejected and not settled partially.

ID	PONTES.UR.05.220.1B
Name	Intra service liquidity transfers initiated in Pontes
Requirement	Pontes shall allow the initiation of intra-service liquidity transfers (via U2A and A2A) resulting in debiting and crediting two DCWs owned by the same Participant.

5.5.4 Settlement of Liquidity Transfers

ID	PONTES.UR.05.230.1AB
Name	Processing of an inbound/outbound liquidity transfer
Requirement	Pontes shall process inbound and outbound liquidity transfers by submitting the corresponding instructions to T2 RTGS relying on Ancillary System settlement Procedure E. Pontes shall process the settlement outcome returned by T2 RTGS and update the relevant DCW balances accordingly.

In the process of inbound liquidity transfer (i.e., funding), once the request is received and checked by the relevant Central Bank node, it automatically creates a payment instruction on the Eurosystem DLT and forwards it to the T2 interface. Once received, the T2 Interface automatically translates the payment instruction into a ISO20022 pain message (payment initiation) message²⁷ and triggers an AS transfer order by debiting that Participant's RTGS DCA and crediting the same amount to the ECB RTGS DCA referred to as the 'Token Issuance Account'. Upon confirmation of the successful settlement in T2 RTGS, received by the T2 interface, an issuance request is automatically generated on the Central Bank node and sent to the ECB Issuer node which automatically debits tokenised CeBM from the ECB's Token Issuance Wallet and credits the respective amount to the Participants' DCW.

In the process of outbound liquidity transfer (i.e. defunding), once the request received and checked by the relevant Central Bank node, it automatically creates a payment instruction on the Eurosystem DLT and instructs a redemption towards ECB Issuer node which debits from the Participant's DCWs the amount of tokenised CeBM specified in its request and credits the same amount of tokenised CeBM to the ECB's Token Issuance Wallet. Once the transfer is completed, the ECB Issuer node automatically submits a payment instruction on the Eurosystem DLT. The T2 Interface translates this into ISO20022 pain messages and triggers an AS transfer order by debiting the ECB's Token Issuance Account (RTGS DCA) and crediting the respective amount to the Participants' RTGS DCAs²⁸.

In addition, Pontes foresees an automatic defunding process, covered in chapter 5.6.

²⁷ Settlement of inbound and outbound liquidity transfers shall be executed via T2 RTGS relying on Ancillary System Settlement Procedure E.

²⁸ Pontes shall process the settlement outcome returned by T2 RTGS accordingly.

ID	PONTES.UR.05.240
Name	Processing of an intra-service liquidity transfer
Requirement	Pontes shall process an intra-service liquidity transfer by debiting and crediting the relevant DCWs for the full amount. If the DCW to debit does not have sufficient funds, the liquidity transfer is rejected and not settled partially.

5.5.5 Settlement Receipts

ID	PONTES.UR.05.280.1B
Name	Successful confirmation of a liquidity transfer
Requirement	Pontes shall notify the successful transfer of funds to the requestor of a liquidity transfer upon successful settlement.

In Pontes, upon successful settlement of a liquidity transfer, Pontes shall notify the initiator of the liquidity transfer request by means of a Liquidity Transfer Response.

5.6 MANDATORY END-OF-DAY DEFUNDING

ID	PONTES.UR.05.350.2
Name	Mandatory End-of-Day defunding
Requirement	Pontes shall enforce a mandatory defunding of all tokenised CeBM balances at the end of each Pontes business day, ensuring that no Participant holds tokenised balances overnight. At the end of each Pontes business day, a process shall be automatically initiated whereby all tokenised CeBM balances held in DCWs are redeemed and credited back to the Participants' RTGS DCAs in T2 RTGS using Ancillary System settlement Procedure E.

Pontes features an automatic and mandatory defunding process to redeem all the tokenised CeBM from the Eurosystem DLT to the Participants' RTGS DCAs via the ECB's Token Issuance Wallet and Token Issuance Account at the end of the Pontes business day and based on the positions provided by the Eurosystem DLT. This automatic defunding process shall ensure that no liquidity stays overnight on neither the Eurosystem DLT nor the Token Issuance Account in T2 RTGS²⁹.

Pontes shall process the mandatory End-of-Day defunding for all DCWs, regardless of the DCW's blocking status.

²⁹ The operational framework of Pontes shall describe an operational procedure for contingency cases i.e. a procedure to handle the case where tokenised CeBM balance is left on the DCWs while the Pontes is closed.

6 MANAGEMENT OF WALLETS AND REFERENCE DATA

This chapter covers Pontes Actors, wallets and reference data requirements for the configuration and operation of the service, including the reference data of Market DLT Platforms relevant for Pontes.

6.1 OVERVIEW

The Pontes service differentiates between different actors which play different roles and have different access rights.

Pontes' static data is stored in Local Reference Data Management (LRDM) components: every Central Bank node manages a LRDM storing data relevant for its Participants.

These actors are Central Banks, Participants, Market DLT Operators and the Pontes Operator. Furthermore, two different objects are described:

- Pontes DCWs, which contain the actual tokenised liquidity, and
- Token Issuance Wallet, which is involved in the liquidity transfers from/to T2 RTGS.

Furthermore, Pontes keeps track of the list of Market DLT Platforms and Market DLT Operators configured and the links among Participants and Market DLT Operators.

Upon configuration, Pontes shall authorise a:

- Participant to instruct on behalf of other Participants – only for Wallet-to-Wallet payments in tokenised CeBM and for Payments with direct settlement in T2 RTGS,
- Market DLT Operators to instruct on behalf of Participants – only for the operations described in chapter 4.1.2.

Finally, Pontes requires a minimum set of configurations in the Common Reference Data Management (CRDM) TARGET Services common component to enable automated processing in the flows of funding, defunding and direct settlement in T2 RTGS, as described in chapter 6.4.7.

Actors

Participants are entities which have a BIC and own DCWs. These wallets cannot have a negative (or overnight) balance.

Market DLT Operators are entities that offer DLT-based services on one or more Market DLT Platforms (outside the perimeter of the Pontes service). Market DLT Operators can instruct on behalf of Participants and communicate with Pontes directly. Responsibility for all actions done by Market DLT Operators remains with the Participant.

Central Banks maintain all reference data associated with an entity of their national community and are responsible for, e.g., the setup and maintenance of a Participant and its wallets. Central Banks can act on behalf of their Participants in contingency situation for a given set of functionalities (e.g. payments, inbound liquidity transfer (funding), outbound liquidity transfer (defunding) and intra service liquidity transfer (between two wallets of the same Participant)). Central Banks can act as Participants and own accounts which they can use for their tokenised transactions-related business.

The **Pontes Operator** is the entity that operates the Pontes service.

Pontes service desk model is defined as follows³⁰:

- (i) Central Banks act as first contact point to support their national community (including Participants and Market DLT Operators).
- (ii) Pontes service desk acts as single, central point of contact for the Central Banks. This central point of contact is in charge of providing direct support to Central Banks, Participants and Market DLT Operators for managing connectivity issues.

Market DLT Platforms

A Market DLT Platform is a DLT service platform used by one (or more) Market DLT Operator(s) where eligible assets are cleared and/or settled and/or delivered.

The list of Market DLT Platforms configured is maintained by the Pontes Operator. The list is available to all the Pontes Actors.

Central Banks configure links among Participants (for Wallet-to-Wallet payments in tokenised CeBM and for Payments with direct settlement in T2 RTGS) and among Participants and Market DLT Operators as described in this document.

Wallets

In general, Participants or Central Banks (acting as Participants) own **DCW**, which Pontes debits and credits during processing of tokenised transactions or wallet-to-wallet liquidity transfers. These wallets cannot have a negative or overnight balance.

European Central Bank owns the **Token Issuance Wallet**, which is operated by the Pontes Operator. It is a technical DCW that allows to issue tokenised CeBM after a successful funding operation and to redeem tokenised CeBM before a successful defunding operation. Pontes requires a single Token Issuance Wallet for the entire Eurosystem. The balance of this wallet reflects at all time the balance of the **Token Issuance Account** in T2 RTGS. The Token Issuance Wallet will only have a negative balance during the day or zero at the end of the day.

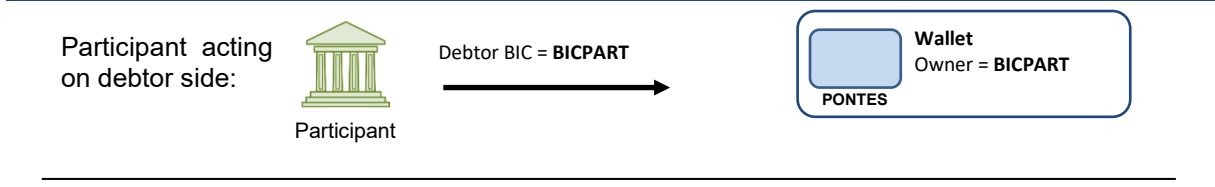
³⁰ Additional details will be provided as part of the operational-related documents.

Business cases – wallet configuration examples

The **examples for business cases** following below visualise some potential wallets configuration which can be realised with the provided functionality.

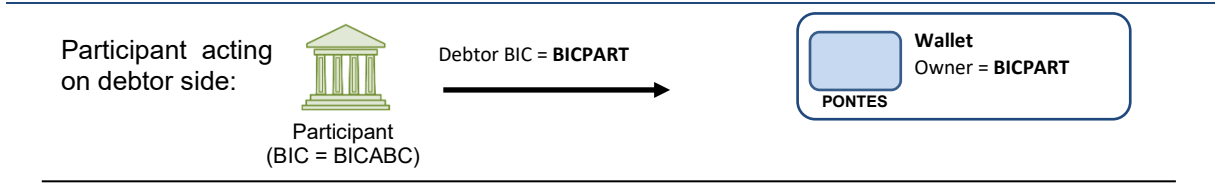
Case 1: Participant instructing transactions for its own business:

Figure 6.1 – Participant instructing transactions for its own business



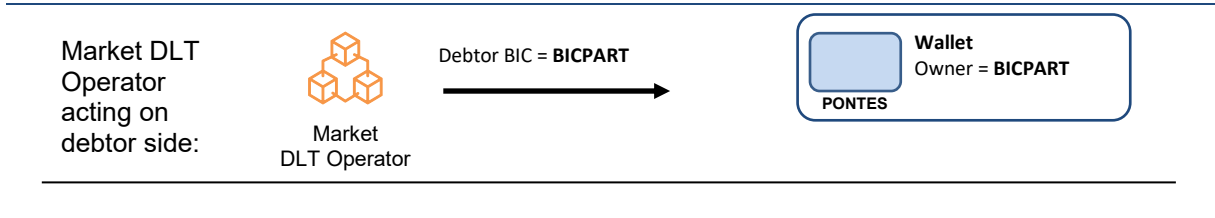
Case 2: Participant instructing transactions on behalf of another Participant:

Figure 6.2 – Participant instructing transactions on behalf of another Participant



Case 3: Market DLT Operator instructing transactions on behalf of a Participant:

Figure 6.3 – Market DLT Operator instructing transactions on behalf of a Participant



6.2 ACTORS AND ROLES

Access and operations to Pontes are strictly managed via Role-Based Access Control (RBAC), restricting users to actions tied to their profile.

The roles defined in Pontes are:

Tokenised CeBM Issuer	It is granted to the ECB and every Central Bank to request the funding of tokenised CeBM from the Token Issuance Wallet owned by the ECB.
DCW Manager	It is granted to the ECB and every Central Bank to allow the creation of DCWs for themselves and for their Participants. It allows the instruction of all the operations specific to managed DCWs on behalf of their Participants in case of contingency, like tokenised CeBM liquidity transfers, Wallet-to-Wallet payments, balances and transactions history consultation ³¹ .
DCW Owner	It is granted to the ECB, Central Banks and Participants to allow the instruction of all the operations specific to own DCWs, like tokenised CeBM liquidity transfers, Wallet-to-Wallet payments, balances and transaction history consultation ³² .
Tokenised CeBM Supervisor	It is granted exclusively to the ECB to allow (i) the consultation of activities related to tokenised CeBM aggregated per Central Bank and (ii) visibility on the Token Issuance Wallet.
National Tokenised CeBM Supervisor	It is granted to every Central Bank to allow the consultation of all activities related to tokenised CeBM under its jurisdiction (DCW balances as well as transactions history (funding, defunding, tokenised CeBM liquidity transfers and Wallet-to-Wallet payments)) ³³ .
Operator	It is granted to the Pontes Operator, and it enables the central configuration of the platform, including managing nodes, the list of participating Central Banks and role definitions, network parameters and other system parameters. It also controls the Business Day processes (e.g. End of Day, Start of Day, ...) and updates the time slots of the various windows (opening and closing times, etc.), and opening dates. The Operator manages also public reference data (e.g. business date and list of Market DLT Platforms).
External entity instructing on behalf	It is granted to Market DLT Operators to instruct on behalf of Participants ³⁴ .

³¹ The DCW Manager role is used also to allow the setup the configuration needed for direct settlement in T2 RTGS for themselves and their Participants. It is also used to allow the relevant operations in case of contingency for direct settlement in T2 RTGS.

³² The DCW Owner role is used also to allow transactions with direct settlement in T2 RTGS. In case a Participant only uses direct settlement in T2 RTGS, it is not needed for the Participant to own a DCW.

³³ The National Tokenised CeBM Supervisor role is used also the consultation of the activities related to direct settlement in T2 RTGS related to the Participants in the Central Bank's jurisdiction.

³⁴ The External entity instructing on behalf role applies to both settlement models as described in chapter 4.1.2.

ID	PONTES.UR.06.010.1B
Name	Central Bank actors
Requirement	Pontes shall enable and allow <i>Central Bank</i>³⁵ actors to: • own a node on the Eurosystem DLT (hosted in the Pontes Operator infrastructure); • act as Participants; • in case of contingency, act on behalf of Participants from their national community; • in case of contingency, transfer liquidity from Pontes DCWs in their books to the RTGS DCA in T2 RTGS (belonging to the same Participant); • manage all Participants' reference data of their national community and all wallets in their books; • restrict the capabilities of Participants from their national community (see blocking and unblocking); • manage links among Participants and Market DLT Operators (to authorise a Market DLT Operator to instruct on behalf of a Participant, and to enable the Participant to specify the linked Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform); • manage links among Participants (to authorise a Participant A to instruct on behalf of a Participant B for Wallet-to-Wallet payments with tokenised CeBM and Payments with direct settlement in T2 RTGS).

DCWs of Participants of a Central Bank's national community are wallets held in the Central Bank's books.

A Central Bank can also be defined as a Participant in the reference data, so that it can own DCWs and operate in Pontes as any other Participant.

ID	PONTES.UR.06.020.1B
Name	Participant actors
Requirement	Pontes shall enable and allow <i>Participant</i> actors to: • own Pontes DCWs; • transfer liquidity from their Pontes DCW to their RTGS DCAs in T2 RTGS and between Pontes DCWs (belonging to the same Participant); • send transactions to settle with tokenised CeBM for their own DCWs; • send transactions to settle with direct settlement in T2 RTGS for their own RTGS DCAs in T2 RTGS; • send Wallet-to-Wallet payments to settle with tokenised CeBM for DCWs on behalf of another Participant (upon configuration); • send Payments with direct settlement in T2 RTGS to settle with CeBM on behalf of another Participant (upon configuration);

³⁵ The European Central Bank (ECB), in line with the current behaviour of the TRAGET Services, can participate with the role of Central Bank for its own Participants.

ID	PONTES.UR.06.030.1B
Name	Market DLT Operator actors
Requirement	Pontes shall know about <i>Market DLT Operators</i> , which can act on behalf of Participants.

Upon configuration by the relevant Central Bank (see PONTES.UR.06.490.1B), Market DLT Operators can instruct on behalf of Participants. Market DLT Operators can communicate with Pontes directly. Responsibility for all actions done by Market DLT Operators on the DCWs on which they are authorised remains with the Participant.

ID	PONTES.UR.06.060.1B
Name	Pontes Operator actor
Requirement	Pontes shall provide a <i>Pontes Operator</i> actor which has unrestricted access to all system data and functionality.

The Pontes Operator is the entity that operates the Pontes service. It is, e.g., responsible for the setup of the configuration of system parameters such as timeout thresholds.

ID	PONTES.UR.06.070.1B
Name	Pontes participation model
Requirement	Pontes shall support participation roles for Pontes Operator, Central Banks, Participants and Market DLT Operators in line with the participation model of other TARGET Services.

The following Table 1.1 summarises some of the characteristics and capabilities of the different actors (unless restricted by access rights) regarding the following items:

- What does the entity own?
- Where can it transfer liquidity from?
- Which wallets can be used for a specific transaction?
- Which management actions can be executed?

Table 1.1: Pontes participation structure overview

	Tokenised CeBM Issuer	DCW Manager	DCW Owner	Tokenised CeBM Supervisor	National Tokenised CeBM Supervisor	Operator	External Entity Instructing on Behalf
Pontes Operator						✓	
Central Banks	✓	✓	✓		✓		
ECB	✓	✓	✓	✓			
Participants			✓				
Market DLT Operators							✓

6.3 WALLET STRUCTURE

6.3.1 Wallet

ID	PONTES.UR.06.080.1B
Name	Wallet types
Requirement	Pontes shall provide wallets which are used for the settlement of transactions with tokenised CeBM and liquidity transfers. There shall be two different wallet types: • Dedicated Cash Wallets (also called Pontes DCW or DCW in this document): Participant wallets (which cannot have a negative or overnight balance). • Token Issuance Wallet: Wallet held by European Central Bank and operated by the Pontes Operator used in the process of funding and defunding, as described in this document.

ID	PONTES.UR.06.090
Name	Wallet identifiers
Requirement	Pontes wallet identifiers shall be ISO compliant and globally unique.

Participants are able to choose their wallet identifiers in compliance with restrictions to be defined in the Pontes User Detailed Functional Specifications (UDFS) (e.g., 34 characters long and composed of a country code and 32 characters).

ID	PONTES.UR.06.100.1B
Name	Pontes Dedicated Cash Wallets (DCW)
Requirement	Pontes shall provide DCWs which are used for the settlement of transactions with tokenised CeBM. The DCWs are owned by Participants and cannot have a negative or overnight balance.

Participant or Central Banks acting as Participants own Pontes DCW.

ID	PONTES.UR.06.590.1A
Name	Token Issuance Wallet
Requirement	Pontes shall provide a Token Issuance Wallet. It is held by the ECB and operated by the Pontes Operator. It is used in the process of funding and defunding as described in this document.

ID	PONTES.UR.06.120.1B
Name	Wallet-level reference data
Requirement	Pontes shall maintain at least the following data for a wallet: • <i>Identifier</i>: The ISO compliant wallet identifier. • <i>Main flag</i>: A flag (true or false) used to identify the Participant's main wallet (every Participant has one and only one main wallet). • <i>Currency</i>: The wallet's currency, which is Euro. • <i>Owner</i>: The Participant or Central Bank (acting as Participant) who owns the wallet. • <i>Manager</i>: The Central Bank of the Participant who owns the wallet. • <i>Opening date</i>: The date as of which a wallet is legally opened. • <i>Closing date</i>: The date as of which a wallet is legally closed. • <i>Status</i>: Current blocking status of the wallet; the two possible statuses are: • unblocked • blocked for both debiting and crediting

ID	PONTES.UR.06.130
Name	Number of DCWs per Participant
Requirement	Each Participant shall be able to own one or many DCWs.

A Participant can hold one or more Pontes DCW in order to segregate its business.

ID	PONTES.UR.06.140.1B
Name	Wallet removal after closing date (A)
Requirement	Pontes shall close and remove wallets after the end of day of their closing date if their wallet balance is zero.

Pontes DCWs can be removed from the system if (i) their balance is zero and (ii) their closing business day ended. Pontes shall ensure that every wallet balance is zero at the end of the business day via the automatic End-of-Day defunding process described in this document.

6.4 REFERENCE DATA

6.4.1 General Requirements

ID	PONTES.UR.06.600.1A
Name	Central Bank reference data
Requirement	Pontes shall maintain at least the following data for a Central Bank: • <i>Identifier</i>: The BIC of the Central Bank. • <i>Short Name</i>: The short name of the Central Bank. • <i>Long Name</i>: The long name of the Central Bank. • <i>Country Code</i>: The ISO 3166 compliant Country Code. • <i>Roles list</i>: List of roles in line with Table 6.1. • <i>Valid from date</i>: The date as of which the Central Bank configuration should be valid in Pontes. • <i>Valid to date</i>: The date until which the Central Bank configuration should be valid in Pontes.

Pontes Operator shall configure Central Bank reference data in Pontes.

ID	PONTES.UR.06.610.1A
Name	Participant reference data
Requirement	Pontes shall maintain at least the following data for a Participant: • <i>Identifier</i>: Identifier of the Participant in Pontes. The BIC referring to the Account BIC (Authorised Account BIC, AUU = direct) of the T2 RTGS Account to be used in the process of funding, defunding and direct settlement in T2 RTGS. • <i>Short Name</i>: The short name of the Participant. • <i>Long Name</i>: The long name of the Participant. • <i>Country Code</i>: The ISO 3166 compliant Country Code (in the jurisdiction of its Central Bank). • <i>Roles list</i>: List of roles in line with Table 6.1. • <i>Valid from date</i>: The date as of which the Participant configuration should be valid in Pontes. • <i>Valid to date</i>: The date until which the Participant configuration should be valid in Pontes.

Central Banks shall configure their Participant reference data in Pontes.

ID	PONTES.UR.06.620.1A
Name	Account mapping reference data
Requirement	Pontes shall maintain at least the following data for an account mapping: • <i>T2 Account reference</i>: The ISO compliant RTGS Account identifier. • <i>Participant reference</i>: Identifier of the Participant in Pontes. • <i>Central Bank code</i>: The code of the responsible Central Bank.

Central Banks shall configure account mapping reference data in Pontes for their Participants.

Having an account mapping configured is a prerequisite for wallets creation: Pontes shall prevent the creation of a DCW prior the configuration of an account mapping.

Each T2 Account Reference is identified with the T2 RTGS Account number held by the Participant in T2 RTGS. This reference is linked to a unique Participant, being the T2 RTGS Account holder in T2 RTGS.

The account mapping reference data is used only for manual reconciliation: the automated processes of funding, defunding and direct settlement in T2 RTGS rely on the Participant identifier (i.e. the BIC referring to the Account BIC (Authorised Account BIC, AUU = direct) of the T2 RTGS Account to be used in the process of funding, defunding and direct settlement in T2 RTGS).

ID	PONTES.UR.06.230.1B
Name	Wallet management actions
Requirement	Pontes shall provide functionalities to create update or delete wallets according to the actors' roles as given in PONTES.UR.06.070.1B.

6.4.2 Wallet Creation, Update and Deletion

ID	PONTES.UR.06.240.1B
Name	DCW creation action
Requirement	Pontes shall allow an actor with suitable permissions to create DCWs and set up their reference data.

Central Banks create DCWs for their Participants.

The Token Issuance Wallet is set up by the Pontes Operator.

ID	PONTES.UR.06.250.1B
Name	DCW update action
Requirement	Pontes shall allow an actor with suitable permissions to update the reference data of DCWs.

Central Banks update DCWs for their Participants.

ID	PONTES.UR.06.260.1B
Name	DCW deletion action
Requirement	Pontes shall allow an actor with suitable permissions to delete DCWs; a DCW can be deleted as long as its closing date has been reached.

Central Banks delete DCWs for their Participants.

ID	PONTES.UR.06.270.1B
Name	DCW creation/update/deletion effect timeframe
Requirement	Pontes shall ensure that newly created DCWs are available on their opening date. DCW updates and deletions shall be effective immediately.

In Pontes data and state changes are effective immediately, with the exception of the limited configuration needed in CRDM common component of TARGET Services detailed in this document.

ID	PONTES.UR.06.280.1B
Name	Instruct On Behalf Link for Wallet-to-Wallet payments in tokenised CeBM creation/update/delete action
Requirement	Pontes shall allow Central Banks to create/update/delete Instruct On Behalf Links between Participants for the settlement of wallet-to-wallet payments in tokenised CeBM.

In order to enable a Participant A to act on behalf of another Participant B (only for wallet-to-wallet payments in tokenised CeBM), the Central Bank of Participant B has to configure an Instruct On Behalf Link between Participant A and Participant B. The configuration:

- Enables the Participant A to act on behalf of the Participant B specifically on the DCW for which the configuration is in place;
- Requires Valid From and Valid To parameters that define the start date and the end date of the configuration;
- (optionally) foresees a Maximum Amount parameter that defines the maximum amount allowed per transaction
- Prevents, for each DCW, to have more than one link active on the same business date.

ID	PONTES.UR.06.630.1A
Name	Instruct On Behalf Link for Payments with direct settlement in T2 RTGS creation/update/delete action
Requirement	Pontes shall allow Central Banks to create/update/delete Instruct On Behalf Links between Participants for the settlement of payments with direct settlement in T2 RTGS.

In order to enable a Participant A to act on behalf of another Participant B (only for payments with direct settlement in T2 RTGS), the Central Bank of Participant B has to configure an Instruct On Behalf Link between Participant A and Participant B. The configuration:

- Enables the Participant A to act on behalf of the Participant B specifically on the RTGS DCA configured for Participant B for the automation of the process of funding, defunding and direct settlement in T2 RTGS;
- Is active until the moment in which the link is deleted;
- Allows, for each Participant, to have more than one link active on the same business date.

ID	PONTES.UR.06.290.1B
Name	Instruct On Behalf Link create/update/delete effect timeframe
Requirement	Pontes shall ensure that Instruct On Behalf Link creations, updates and deletions shall be effective immediately.

6.4.3 Participant Blocking and Unblocking

ID	PONTES.UR.06.340.1B
Name	Participant blocking action
Requirement	Pontes shall allow a Central Bank to block a Participant of its national community for both crediting and debiting. This Participant blocking shall result in blocking of all DCWs owned by that Participant.

The Participant blocking shall apply to both settlement models.

ID	PONTES.UR.06.350.1B
Name	Participant unblocking action
Requirement	Pontes shall allow a Central Bank to unblock a Participant of its national community for both crediting and debiting. This Participant unblocking shall result in unblocking of all DCWs owned by that Participant.

The Participant unblocking shall apply to both settlement models.

ID	PONTES.UR.06.360.1B
Name	Participant blocking/unblocking effect timeframe
Requirement	Pontes shall ensure that Participant blocking and unblocking are in effect immediately; this shall encompass DCW blocking due to participant blocking and DCW unblocking due to participant unblocking.

The Participant blocking/unblocking shall have immediate effect for both settlement models.

ID	PONTES.UR.06.370.1B
Name	Liquidity transfers for blocked wallets
Requirement	Pontes shall allow Central Banks to instruct outbound liquidity transfers (defunding) from any DCW in their books, regardless of the DCW's blocking status.

Inbound liquidity transfers (funding) and intra service liquidity transfers (wallet-to-wallet transfer between two DCWs of the same Participant) shall be rejected in case of blocked DCWs even if instructed by a Central Bank.

6.4.4 Market DLT Platform-related reference data

ID	PONTES.UR.06.400.1B
Name	Market DLT Platform reference data
Requirement	Pontes shall maintain at least the following data for a Market DLT Platform: • <i>Identifier</i>: The Market DLT Platform identifier. • <i>Name</i>: The name of the Market DLT Platform. • <i>Owner</i>: The name of entity owning the Market DLT Platform, where relevant. • <i>Opening date</i>: The date as of which a Market DLT Platform has been added to the list of available Market DLT Platforms. • <i>Closing date</i>: The date as of which a Market DLT Platform has been deleted from the list of available Market DLT Platforms.

ID	PONTES.UR.06.410
Name	Market DLT Platform create/update/delete action
Requirement	Pontes shall allow Pontes Operator to create/update/delete the reference data of Market DLT Platforms.

ID	PONTES.UR.06.420.1B
Name	Market DLT Platform create/update/delete effect timeframe
Requirement	Pontes shall ensure that newly created Market DLT Platforms are available on their opening date. Market DLT Platforms updates and deletions shall be effective immediately.

ID	PONTES.UR.06.430.1B
Name	List of Market DLT Platforms in Pontes
Requirement	Pontes shall provide a list of Market DLT Platforms.

In order to provide Participants and Central Banks with a list of Market DLT Platforms configured Pontes, a table of all Market DLT Platforms, has to be maintained (see PONTES.UR.10.120.1A).

ID	PONTES.UR.06.640.1A
Name	Market DLT Operator reference data
Requirement	Pontes shall maintain at least the following data for a Market DLT Operator: • <i>Identifier</i>: The Market DLT Operator identifier. It is a combination of two parts (i) Market DLT Platform identifier and (ii) BIC or, if the BIC is not available, Legal Entity Identifier (LEI) of the Market DLT Operator • <i>Market DLT Platform identifier</i>: The identifier in Pontes of the Market DLT Platform used by the Market DLT Operator. • <i>Central Bank code</i>: The code of the responsible Central Bank. • <i>Opening date</i>: The date as of which a Market DLT Platform has been added to the list of available Market DLT Platforms. • <i>Closing date</i>: The date as of which a Market DLT Platform has been deleted from the list of available Market DLT Platforms. • <i>Status</i>: Current blocking status of the Market DLT Operator; the two possible statuses are: • unblocked • blocked

ID	PONTES.UR.06.440.1B
Name	List of Market DLT Operators in Pontes
Requirement	Pontes shall provide a list of Market DLT Operators.

In order to provide Participants and Central Banks with a list of Market DLT Operators configured in Pontes, a table of all Market DLT Operators, has to be maintained (see PONTES.UR.10.110.1A).

ID	PONTES.UR.06.490.1B
Name	Participant – Market DLT Operator Link create/update/delete action
Requirement	Pontes shall allow Central Banks to create/update/delete a link between a Participant and a Market DLT Operator.

Central Banks configure links between a Participant and Market DLT Operator.

The existence of Participant – Market DLT Operator Link is mandatory:

- (case 1) To enable a Market DLT Operator to instruct on behalf of a Participant (i) using a DCW of the Participant for settlement in tokenised CeBM on the Eurosystem DLT and/or (ii) using the relevant RTGS DCA for direct settlement in T2 RTGS. This applies to all the functionalities listed in 4.1.2,
- (case 2) To enable a Participant to directly instruct DvPs and PvPs, specifying the linked Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform.

However, Pontes does not distinguish the two scenario and does not technically prevent a Market DLT Operator to instruct on behalf of the Participant (case 1) when a link between the two was configured,

even if the Market DLT Operator is only intended to be used to reference the entity legally responsible for the settlement of the leg on the Market DLT Platform (case 2).

The configuration:

- Enables the Market DLT Operator to act on behalf of the Participant for (i) all its DCWs for settlement in tokenised CeBM on the Eurosystem DLT and/or (ii) using the relevant RTGS DCA for settlement in T2 RTGS. This applies to all the functionalities listed in 4.1.2;
- Requires Valid From and Valid To parameters that define the start date and the end date of the configuration;
- Allows, for each Participant, to have more than one link active on the same business date.
- Allows, for each Market DLT Operator, to have more than one link active on the same business date.

ID	PONTES.UR.06.500.1B
Name	Participant – Market DLT Operator Link create/update/delete effect timeframe
Requirement	Pontes shall ensure that Participant – Market DLT Operator Links creations, updates and deletions shall be immediately effective.

ID	PONTES.UR.06.510.1B
Name	Market DLT Operator blocking action
Requirement	Pontes shall allow the Central Bank that configured a Market DLT Operator to block it. This Market DLT Operator blocking shall result in blocking of all instructions related to this entity.

ID	PONTES.UR.06.520.1B
Name	Market DLT Operator unblocking action
Requirement	Pontes shall allow the Central Bank that configured a Market DLT Operator to unblock it. This unblocking shall restore the ability to instruct on behalf of Participants by Market DLT Operators, and Participants to instruct directly specifying the Market DLT Operator as legally responsible for the settlement of the leg on the Market DLT Platform.

ID	PONTES.UR.06.530
Name	Market DLT Operator blocking/unblocking effect timeframe
Requirement	Pontes shall ensure that Market DLT Operator blocking and unblocking are in effect immediately.

6.4.5 System Settings

ID	PONTES.UR.06.540.1B
Name	System settings change actions
Requirement	Pontes shall provide functionalities for the creation, update and deletion of system settings. Included system settings shall be (non-exhaustive list): configurable parameters explicitly mentioned in user requirements (timeout duration for all DvP and PvP transactions and for both settlement models)

Pontes Operator is responsible for the configuration of system settings.

ID	PONTES.UR.06.550.1B
Name	System settings change effect timeframe
Requirement	Pontes shall ensure that changes done to system settings are in effect immediately.

System setting changes should be in effect immediately.

6.4.6 ISO Compliance

ID	PONTES.UR.06.570.1B
Name	Currency codes
Requirement	Pontes shall store currencies as defined by the ISO standard.

Currencies are, e.g., used as a parameter of wallets, which have to match on the debtor and creditor side. Euro is the only currency available in Pontes.

ID	PONTES.UR.06.580
Name	Timestamps
Requirement	Pontes shall use timestamp formats compliant with ISO for reporting and querying.

6.4.7 Configuration in Common Reference Data Management (CRDM)

For Pontes, the following configuration in the Common Reference Data Management (CRDM) requires no changes to the current functionalities of the TARGET Services. CRDM is the common component of the TARGET Services that provides users with interfaces allowing the creation, updating and deletion of common reference data related to parties, cash accounts and configuration rules and parameters.

ID	PONTES.UR.06.650.2
Name	Token Issuance Account
Requirement	Pontes shall provide automated funding and defunding processing relying on a Token Issuance Account in T2 RTGS. The Token Issuance Account (a T2 RTGS DCA) is involved in the funding and defunding operations initiated from the Eurosystem DLT. It functions as an escrow account held by the ECB and operated by the Pontes Operator, credited for funding operations from the Participants' RTGS DCAs and debited for defunding operations toward Participants' RTGS DCAs. Its balance can only be positive or zero and shall mirror the Token Issuance Wallet's balance, with negative sign.

ID	PONTES.UR.06.660.2
Name	Configuration of Settlement Bank Account Group (SBAG)
Requirement	Pontes shall rely on the configuration in CRDM of a Settlement Bank Account Group (SBAG).

In order to enable the end-to-end automation of funding, defunding and direct settlement in T2 RTGS, a Settlement Bank Account Group (SBAG) shall be configured.

The SBAG shall contain (i) the Token Issuance Account and (ii) the RTGS DCAs used by the Participants.

The Pontes Operator shall create the SBAG, using existing CRDM functionalities. Central Banks shall be responsible for the addition (and removal) of their Participants' RTGS DCAs to the SBAG, using existing CRDM functionalities³⁶.

³⁶ See additional details in Common Reference Data Management (CRDM) User Detailed Functional Specification (UDFS).

7 REPORTS

The chapter describes report requirements in the context of Pontes. A report may contain information on individual wallets or transactions which can be made available to the Pontes Actors.

7.1 OVERVIEW

Reports shall be available on request in Pontes to support the business monitoring and reconciliation of Pontes Actors, according to their needs. Taking into account the time, scope and nature of data, several reports are foreseen. The data contained in the reports depends on the actor and its roles.

Pontes Actors shall be able to make a request based on a pre-defined list of reports, which depends on the actor's roles.

No report subscription is foreseen in Pontes: Pontes Actors shall request the extraction of reports via A2A and/or U2A channels. The requestor shall receive the report on the same channel used to request it.

7.2 GENERAL REQUIREMENTS

ID	PONTES.UR.07.010.1B
Name	Report generation
Requirement	Pontes shall initiate the generation of reports using the data available at the time of the request.

ID	PONTES.UR.07.020.1B
Name	Reports availability via application-to-application mode
Requirement	All reports shall be available via application-to-application mode during Pontes operating hours, when queried by the Pontes Actors in line with Table 7.1.

ID	PONTES.UR.07.030.1B
Name	Reports availability via user-to-application mode
Requirement	All reports shall be available via user-to-application during Pontes operating hours, when queried by the Pontes Actors in line with Table 7.1.

ID	PONTES.UR.07.040.1B
Name	Report addressee and data scope
Requirement	Pontes shall provide to its actors reports based on the permissions listed in the following Table 7.1

The following Table summarises the data scope that Pontes Actors have.

Table 7.1: Report data scope

Report	Central Bank	Participant	Market DLT Operator
National tokenised CeBM overview extraction ³⁷	All DCWs in its books	No	No
Funding and defunding operations extraction	All DCWs in its books	Own DCWs	No
Funding and defunding operations extraction (transactions in T2 RTGS)	All DCWs in its books	Own DCWs	No
Cash posting history extraction	All DCWs in its books	Own DCWs	No
Transactions in tokenised CeBM extraction	All DCWs in its books	Own DCWs	No
Transactions with direct settlement in T2 RTGS	All DCAs in its books	Own DCA	No

ID	PONTES.UR.07.060
Name	Report timestamp
Requirement	Pontes shall provide timestamps in an ISO compliant format.

Pontes shall use the timestamp format YYYY-MM-DDThh:mm:ss.sssZ. The date is displayed with a four-digit year and two digits for both month and day. The time is displayed with two digits for each of the hour, minute, second and three digits for millisecond. The letter T is used as a delimiter between date and time. The letter Z is used as a zone designator for the zero UTC offset.

³⁷ This report is only available via User-to-Application (U2A) channel.

7.3 TYPE OF REPORTS

ID	PONTES.UR.07.300.1A
Name	National tokenised CeBM overview extraction
Requirement	Pontes shall enable Central Banks to extract the overview of the tokenised CeBM held by the Participants in their jurisdictions.

The *National tokenised CeBM supervision report* lists the Participants in a given jurisdiction and for each Participant the total amount of tokenised CeBM held in DCWs of the Participant.

The report should contain at least the following information:

- participant BIC, which is the BIC of the Participant in Pontes
- total held, which is the total amount of tokenised CeBM held in all the DCWs of the Participant.

ID	PONTES.UR.07.310.1A
Name	Funding and defunding operations extraction
Requirement	Pontes shall enable Pontes Actors to extract the list of funding and defunding operations related to all the DCWs in its data scope.

The *Funding and defunding operations report* lists all the funding and defunding operations related to all the DCWs in the Pontes Actor's data scope. The extraction retrieves data related to the whole end-to-end funding and defunding operations: this encompasses both the steps on the Eurosystem DLT and the transactions in T2 RTGS triggered in the process.

The report should contain at least the following information:

- request ID
- amount
- currency
- status
- T2 account reference, which is the account number in T2 RTGS linked to the wallet to be funded / defunded
- debited wallet
- debited wallet owner
- credited wallet
- credited wallet owner
- creation date
- acceptance timestamp
- payment submission timestamp
- payment settlement timestamp
- issuance creation timestamp
- issuance settlement timestamp
- redemption creation timestamp
- redemption settlement timestamp
- settlement timestamp
- settlement business date

When requesting the report extraction, Pontes Actors can filter at least on:

- the request type (all, funding, defunding);
- the request status.

When requesting the report extraction via A2A, Pontes Actors can also filter on:

- start date;
- end date;
- list of wallets to consider in the scope of the request;
- T2 account reference.

ID	PONTES.UR.07.320.1A
Name	Funding and defunding operations (transactions in T2 RTGS) extraction
Requirement	Pontes shall enable Pontes Actors to extract the list of transactions in T2 RTGS triggered in the context of funding and defunding operations related to all the DCWs in its data scope.

The *Funding and defunding operations (transactions in T2 RTGS) report* lists all the transaction in T2 RTGS triggered in the context of funding and defunding operations related to all the DCWs in the Pontes Actor's data scope.

The report should contain at least the following information:

- payment ID
- correlation ID
- amount
- currency
- status
- payer
- receiver
- submission timestamp
- last updated timestamp

When requesting the report extraction, Pontes Actors can filter at least on:

- the payment status.

When requesting the report extraction via A2A, Pontes Actors can also filter on:

- start date;
- end date;
- list of wallets to consider in the scope of the request;
- T2 account reference.

ID	PONTES.UR.07.330.1A
Name	Cash posting history extraction
Requirement	Pontes shall enable Pontes Actors to extract the list of cash postings related to all the DCWs in its data scope.

The *Cash posting history report* lists all the cash postings related to all the DCWs in the Pontes Actor's data scope. Cash postings are intended as credits and debits related to settled transactions in tokenised CeBM.

The report should contain at least the following information:

- transaction ID
- correlation ID
- amount
- currency
- status
- wallet
- wallet owner
- counterpart
- counterpart wallet
- movement type (credit, debit)
- transaction type
- T2 account reference
- settlement timestamp

When requesting the report extraction, Pontes Actors can filter at least on:

- transaction type (transfer, payment, DvP payment, Pvp payment, PFoD, issuance, redemption)
- start date
- end date
- list of wallets to consider in the scope of the request
- wallet owner
- T2 account reference.

ID	PONTES.UR.07.340.1A
Name	Transactions in tokenised CeBM extraction
Requirement	Pontes shall enable Pontes Actors to extract the list of transactions in tokenised CeBM related to all the DCWs in its data scope.

The *Transactions in tokenised CeBM report* lists all the transactions in tokenised CeBM related to all the DCWs in the Pontes Actor's data scope. The extraction retrieves data related to transactions in a status different from SETTLED.

The report should contain at least the following information:

- operation ID
- amount
- currency
- status

- transaction type
- debited wallet
- debited wallet owner
- debited T2 account reference
- credited wallet
- credited wallet owner
- credited T2 account reference
- settlement business date

When requesting the report extraction, Pontes Actors can filter at least on:

- transaction type (transfer, payment, DvP payment, PvP payment, PFoD, issuance, redemption)
- status
- submission start date
- submission end date
- settlement start date
- settlement end date
- list of wallets to consider in the scope of the request
- credited T2 account reference.

ID	PONTES.UR.07.350.1A
Name	Transactions with direct settlement in T2 RTGS extraction
Requirement	Pontes shall enable Pontes Actors to extract the list of transactions with direct settlement in its data scope.

The *Transactions with direct settlement in T2 RTGS report* lists all the transactions with direct settlement in the Pontes Actor's data scope.

The report should contain at least the following information:

- payment ID
- correlation ID
- amount
- currency
- status
- payment type
- payer
- receiver
- submission date
- settlement business date
- instructing entity, which is the reference in Pontes of the entity submitting the payment

When requesting the report extraction, Pontes Actors can filter at least on:

- transaction type (payment with direct settlement in T2 RTGS, DvP payment with direct settlement in T2 RTGS, PvP payment with direct settlement in T2 RTGS)
- status

8 QUERIES

Pontes provides real time queries which allow Central Banks, Participants and Market DLT Operators to retrieve data based on the most recent situation known to Pontes. This chapter describes the different queries available.

8.1 OVERVIEW

Pontes provides queries to Pontes Actors to enable them to monitor the current balance of wallets or settlement states of transactions. These queries are available in application-to-application (A2A) or user-to-application (U2A) mode. The reply to a query is transmitted via the same channel as the query itself.

ID	PONTES.UR.08.010
Name	Queries data scope
Requirement	Pontes shall provide the possibility for Pontes Actors to query data in their data scope, according to the role of the actor doing such queries.

Pontes restricts access to data based on the permissions outlined in Table Table 8.2, Table 8.3 and Table 8.4.

- Central Banks have access to all wallets in their books (and subsequently to all transactions on these wallets),
- Participants can only access their own wallets,
- Access for Market DLT Operators is even further restricted to the DvP and PvP transactions instructed on behalf of Participants.

Pontes Operator has full access to all data.

8.2 GENERAL REQUIREMENTS

ID	PONTES.UR.08.020.1AB
Name	Availability for queries in application-to-application mode
Requirement	Pontes shall process the following queries in application-to-application mode during its operating hours: - On the wallet: - o Wallet Balance Query (see PONTES.UR.08.070.1B); - On a specific liquidity transfer / transaction: - o Liquidity Transfer Status Query (see PONTES.UR.08.090.1B); - o (DvP) Get Key and Payment Information Query (see PONTES.UR.08.110.1B); - o (PvP) Get Key and Payment Information Query (see PONTES.UR.08.120.1B); - o (DvP) Initialisation Query (see PONTES.UR.08.130.1B); - o (PvP) Initialisation Query (see PONTES.UR.08.410.1B); - o Wallet-to-Wallet Payment Status Query (see PONTES.UR.08.100.1B); - o Payment with direct settlement in T2 RTGS Status Query (see PONTES.UR.08.240.1A); - On multiple liquidity transfers / transactions: - o Transactions in Tokenised CeBM Query (see PONTES.UR.08.250.1A); - o Transactions with direct settlement in T2 RTGS Query (see PONTES.UR.08.260.1A); - o Wallet Settled Transactions Query (see PONTES.UR.08.270.1A); - On the reference data: - o Participant Query (see PONTES.UR.08.300.1A); - o Participants Query (see PONTES.UR.08.310.1A); - o Central Bank Query (see PONTES.UR.08.320.1A); - o Central Banks Query (see PONTES.UR.08.330.1A); - o Wallet Reference Data Query (see PONTES.UR.08.340.1A); - o Wallets Reference Data Query (see PONTES.UR.08.350.1A); - o T2 Account Reference Query (see PONTES.UR.08.360.1A); - o T2 Account References Query (see PONTES.UR.08.370.1A); - o Participant – Market DLT Operator Links Query (see PONTES.UR.08.380.1A); - o Instruct On Behalf Link (for wallet-to-wallet payments) Query (see PONTES.UR.08.390.1A); - o Instruct On Behalf Link (for payments with direct settlement in T2 RTGS) Query (see PONTES.UR.08.400.1A).

ID	PONTES.UR.08.030.1AB
Name	Availability for queries in user-to-application mode
Requirement	Pontes shall process the following queries in user-to-application mode during its operating hours: - On the wallet: - o Wallet Balance Query (see PONTES.UR.08.070.1B); - On a specific liquidity transfer / transaction: - o Liquidity Transfer Status Query (see PONTES.UR.08.090.1B); - o Wallet-to-Wallet Payment Status Query (see PONTES.UR.08.100.1B); - o Payment with direct settlement in T2 RTGS Status Query (see PONTES.UR.08.240.1A); - On multiple liquidity transfers / transactions: - o Transactions in Tokenised CeBM Query (see PONTES.UR.08.250.1A); - o Transactions with direct settlement in T2 RTGS Query (see PONTES.UR.08.260.1A); - o Liquidity Transfers Query (see PONTES.UR.08.150.1B); - o Wallet Settled Transactions Query (see PONTES.UR.08.270.1A); - On the reference data: - o User Query (see PONTES.UR.08.280.1A); - o Users Query (see PONTES.UR.08.290.1A); - o Participant Query (see PONTES.UR.08.300.1A); - o Participants Query (see PONTES.UR.08.310.1A); - o Central Bank Query (see PONTES.UR.08.320.1A); - o Central Banks Query (see PONTES.UR.08.330.1A); - o Wallet Reference Data Query (see PONTES.UR.08.340.1A); - o Wallets Reference Data Query (see PONTES.UR.08.350.1A); - o T2 Account Reference Query (see PONTES.UR.08.360.1A); - o T2 Account References Query (see PONTES.UR.08.370.1A); - o Participant – Market DLT Operator Links Query (see PONTES.UR.08.380.1A); - o Instruct On Behalf Link (for wallet-to-wallet payments) Query (see PONTES.UR.08.390.1A); - o Instruct On Behalf Link (for payments with direct settlement in T2 RTGS) Query (see PONTES.UR.08.400.1A).

ID	PONTES.UR.08.040
Name	Availability of data
Requirement	Pontes shall process all queries in real time, based on the latest available data

Queries sent in A2A mode or in U2A mode are not queued and processed immediately, using the most recent data available in the system.

ID	PONTES.UR.08.050.1B
Name	Processing of queries
Requirement	Pontes shall take into account all access rights while processing queries and only return results if the querying party has access to the underlying data according to Table 8.1.

The following Table summarises the different access that Pontes Actors have.

Table 8.1: Query permissions on wallets

Query	Central Bank	Participant	Market DLT Operator
Wallet Balance Query	All DCWs in its books	Own DCWs	No

Table 8.2: Query permissions on liquidity transfers and transactions

Query	Central Bank	Participant	Market DLT Operator
Liquidity Transfer Status Query	Liquidity transfers in all DCWs in its books	Liquidity transfers in own DCWs	No
Wallet-to-Wallet Payment Status Query	Wallet-to-Wallet transactions in all DCWs in its books	Wallet-to-Wallet transactions in own DCWs	No
Payment in T2 RTGS Status Query	Payments in T2 RTGS in all DCAs in its books	Payments in T2 RTGS in own DCA	No
(DvP) Get Key and Payment Information Query ³⁸	No (only applicable if Central Bank acts in its role of Participant – see next column)	DvP transactions in own DCWs (or DCAs in the case of direct settlement in T2 RTGS)	Instructed DvP transactions
(DvP) Initialisation Query ³⁹	No (only applicable if Central Bank acts in its role of Participant – see next column)	DvP transactions in own DCWs (or DCA in the case of direct settlement in T2 RTGS)	Instructed DvP transactions

³⁸ The same query applies to PvP transactions

³⁹ The same query applies to PvP transactions

Table 8.3: Query permissions on multiple liquidity transfers and transactions

Query	Central Bank	Participant	Market DLT Operator
Transactions in Tokenised CeBM Query	Transactions in all DCWs in its books	Transactions in all DCWs in own DCWs	No
Transactions with direct settlement in T2 RTGS Query	Transactions settled in all DCAs in its books	Transactions settled in own DCA	No
Liquidity Transfers Query	Liquidity Transfers in all DCWs in its books	Liquidity Transfers in own DCWs	No
Wallet Settled Transactions Query	Transactions in all DCWs in its books	Transactions in all DCWs in own DCWs	No

Table 8.4: Query permissions on reference data

Query	Central Bank	Participant	Market DLT Operator
User Query	Users (of the Central Bank, Participants and Market DLT Operator) in the Central Bank's jurisdiction	Users of the Participant	No
Users Query	Users (of the Central Bank, Participants and Market DLT Operator) in the Central Bank's jurisdiction	Users of the Participant	No
Participant Query	All Participants in Pontes	All Participants in Pontes	No
Participants Query	All Participants in Pontes	All Participants in Pontes	No
Central Bank Query	All Central Banks in Pontes	All Central Banks in Pontes	No
Central Banks Query	All Central Banks in Pontes	All Central Banks in Pontes	No
Wallet Reference Data Query	All DCWs in its books	Own DCWs	No
Wallets Reference Data Query	All DCWs in its books	Own DCWs	No
T2 Account Reference Query	T2 Account References in its jurisdiction	T2 Account Reference to its BIC in Pontes	No
T2 Account References Query	T2 Account References in its jurisdiction	T2 Account Reference to its BIC in Pontes	No
Participant – Market DLT Operator Links Query	Links to Participants in its jurisdiction	Links in which the Participant is involved	No
Instruct On Behalf Link (for wallet-to-wallet payments) Query	Links to Participants in its jurisdiction	Links in which the Participant is involved	No

Query	Central Bank	Participant	Market DLT Operator
Instruct On Behalf Link (for payments with direct settlement in T2 RTGS) Query	Links to Participants in its jurisdiction	Links in which the Participant is involved	No

ID	PONTES.UR.08.060
Name	Query timestamp
Requirement	Pontes shall provide timestamps in an ISO compliant format.

Pontes uses the timestamp format YYYY-MM-DDThh:mm:ss.sssZ. This requirement is identical to PONTES.UR.07.060, which covers reports.

8.3 TYPE OF QUERIES

ID	PONTES.UR.08.070.1B
Name	Wallet Balance Query
Requirement	Pontes shall provide a <i>Wallet Balance Query</i> to its actors, which returns the current balance and status of one DCW.

The query should support the following selection criterion:

- Wallet identifier.

The query should return at least the following information for one wallet:

- Pontes Participant identifier;
- Wallet identifier;
- current balance;
- currency.

Table 8.1 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.090.1B
Name	Liquidity Transfer Status Query
Requirement	Pontes shall provide a Liquidity Transfer Status Query to its actors, which returns the current status of one liquidity transfer.

The query should support Liquidity Transfer Status Query Request (see PONTES.UR.09.400.1B) and Liquidity Transfer Status Query Response (see PONTES.UR.09.410.1B).

Table 8.2 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.100.1B
Name	Wallet-to-Wallet Payment Status Query
Requirement	Pontes shall provide a Wallet-to-Wallet Payment Status Query to its actors, which returns the current status of one Wallet-to-Wallet Payment.

The query should support Wallet-to-Wallet Payment Status Query Request (see PONTES.UR.09.360) and Wallet-to-Wallet Payment Status Query Response (see PONTES.UR.09.370.1B).

Table 8.2 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.240.1A
Name	Payment with direct settlement in T2 RTGS Status Query
Requirement	Pontes shall provide a Payment with direct settlement in T2 RTGS Status Query to its actors, which returns the current status of one Payment with direct settlement in T2 RTGS.

The query should support Payment with direct settlement in T2 RTGS Status Query Request (see PONTES.UR.09.460.1A) and Payment with direct settlement in T2 RTGS Status Query Response (see PONTES.UR.09.470.1A).

Table 8.2 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.110.1B
Name	(DvP) Get Key and Payment Information Query
Requirement	Pontes shall provide a (DvP) Get Key and Payment Information Query to its actors, which returns the current status of one DvP and the requested key, if relevant.

The query should support (DvP) Get Key and Payment Information Request (see PONTES.UR.09.200.1B) and (DvP) Get Key and Payment Information Response (see PONTES.UR.09.210.1B).

Table 8.2 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.120.1B
Name	(PvP) Get Key and Payment Information Query
Requirement	Pontes shall provide a (PvP) Get Key and Payment Information Query to its actors, which returns the current status of one Payment -versus-Payment and the requested key, if relevant.

The query should support (PvP) Get Key and Payment Information Request (see PONTES.UR.09.300.1B) and (PvP) Get Key and Payment Information Response (see PONTES.UR.09.310.1B).

Table 8.2 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.130.1B
Name	(DvP) Initialisation Query
Requirement	Pontes shall provide a (DvP) Initialisation Query to its actors, which returns for DvPs the information of the DvPs initialised.

The query should support (DvP) Initialisation Query Request (see PONTES.UR.09.220) and (DvP) Initialisation Query Response (see PONTES.UR.09.230.1B).

Table 8.2 lists actors' permissions regarding access to the underlying data.

In case of a DvP initialised by:

- a Participant, a Market DLT Operator (acting on behalf of the Participant) can send a (DvP) Initialisation Query Request if the DvP affects a DCW on which the Market DLT Operator is authorised on. This would enable the Market DLT Operator to follow-up in case of unavailability of the Participant.
- a Market DLT Operator (acting on behalf of the Participant), the Participant can send a (DvP) Initialisation Query Request. This would enable the Participant to follow-up in case of unavailability of the Market DLT Operator.

(DvP) Initialisation Query Requests can be sent multiple times.

ID	PONTES.UR.08.410.1B
Name	(PvP) Initialisation Query
Requirement	Pontes shall provide a (PvP) Initialisation Query to its actors, which returns for PvPs the information of the PvP initialised.

The query shall be in line with PONTES.UR.08.130.1B for the retrieval of PvP transactions.

ID	PONTES.UR.08.150.1B
Name	Liquidity Transfers Query
Requirement	Pontes shall provide a Liquidity Transfers Query to its actors, which supports filter criteria on liquidity transfers and returns multiple liquidity transfers matching the provided criteria.

The query should support Funding and defunding operations extraction (PONTES.UR.07.310.1A) and Funding and defunding operations (transactions in T2 RTGS) extraction (PONTES.UR.07.320.1A).

Table 8.3 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.250.1A
Name	Transactions in Tokenised CeBM Query
Requirement	Pontes shall provide a Transactions in tokenised CeBM Query to its actors, which supports filter criteria on transactions in tokenised CeBM and returns multiple transactions in tokenised CeBM matching the provided criteria.

The query should support Transactions in tokenised CeBM extraction (PONTES.UR.07.340.1A).

Table 8.3 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.260.1A
Name	Transactions with direct settlement in T2 RTGS Query
Requirement	Pontes shall provide a Transactions with direct settlement in T2 RTGS Query to its actors, which supports filter criteria on transactions with direct settlement in T2 RTGS and returns multiple transactions with direct settlement in T2 RTGS matching the provided criteria.

The query should support Transactions with direct settlement in T2 RTGS extraction (PONTES.UR.07.350.1A).

Table 8.3 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.270.1A
Name	Wallet Settled Transactions Query
Requirement	Pontes shall provide a Wallet Settled Transactions Query to its actors, which returns all the transactions settled on the specified wallet.

Table 8.3 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.280.1A
Name	User Query
Requirement	Pontes shall provide a User Query to its actors, which returns the information related to a User.

The query should support the following selection criterion:

- User identifier.

The query should return at least the following information for one user:

- Username;
- Last name;
- First name;
- Pontes Actor reference;
- Status (enabled, disabled);
- Access rights.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.290.1A
Name	Users Query
Requirement	Pontes shall provide a Users Query to its actors, which returns the information related to all to all users in the data scope of the requestor. If the requestor is a Central Bank, it returns all the users (of the Central Bank, Participants and Market DLT Operator) in the Central Bank's jurisdiction. If the requestor is a Participant, it returns all the users of that Participant.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.300.1A
Name	Participant Query
Requirement	Pontes shall provide a Participant Query to its actors, which returns the information related to a Participant.

The query should support the following selection criterion:

- Participant identifier.

The query should return at least the following information for one participant:

- Participant BIC in Pontes;
- Long name;
- Short name;
- Valid from date;
- Valid to date;
- Status (blocked, not blocked);
- Access rights.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.310.1A
Name	Participants Query
Requirement	Pontes shall provide a Participants Query to its actors, which returns the information related to all Participants in Pontes.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.320.1A
Name	Central Bank Query
Requirement	Pontes shall provide a Central Bank Query to its actors, which returns the information related to a Central Bank.

The query should support the following selection criterion:

- Central Bank identifier.

The query should return at least the following information for one Central Bank:

- Central Bank BIC in Pontes;
- Name;
- Country code;
- Central Bank code;
- Country name.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.330.1A
Name	Central Banks Query
Requirement	Pontes shall provide a Central Banks to its actors, which returns the information related to all Central Banks in Pontes.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.340.1A
Name	Wallet Reference Data Query
Requirement	Pontes shall provide a Wallet Reference Data Query to its actors, which returns the reference data information related to a wallet.

The query should support the following selection criterion:

- Wallet ID;
- Owner BIC;
- Country code;
- Creation date (start date, end date).

The query should return at least the following information for one wallet:

- Wallet ID;
- Owner BIC;
- Currency;
- Country code;
- Creation date;
- Valid from date;
- Valid to date;
- Status (blocked, not blocked);
- Main flag.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.350.1A
Name	Wallets Reference Data Query
Requirement	Pontes shall provide a Wallets Reference Data Query to its actors, which returns the information related to all wallets in Pontes in its data scope.

The query should support the following selection criterion:

- Owner BIC;
- Country code;
- Creation date (start date, end date).

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.360.1A
Name	T2 Account Reference Query
Requirement	Pontes shall provide a T2 Account Reference Query to its actors, which returns the information related to a T2 Account Reference.

The query should support the following selection criterion:

- T2 Account reference.

The query should return at least the following information for one T2 Account Reference:

- T2 Account reference, which is the DCA number in T2 RTGS;
- Participant BIC in Pontes;
- Central Bank code;
- Country code.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.370.1A
Name	T2 Account References Query
Requirement	Pontes shall provide a T2 Account References Query to its actors, which returns the information related to all T2 Account References in its data scope.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.380.1A
Name	Participant – Market DLT Operator Links Query
Requirement	Pontes shall provide a Participant – Market DLT Operator Links Query to its actors, which returns the information related to all the Participant – Market DLT Operator Links in Pontes.

The query should return at least the following information for one Participant – Market DLT Operator Link:

- Participant BIC in Pontes;
- Market DLT Operator reference;
- Market DLT Platform reference;
- Central Bank code;
- Valid from date;
- Valid to date.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.390.1A
Name	Instruct on Behalf Link (for wallet-to-wallet payments) Query
Requirement	Pontes shall provide a Instruct on Behalf Link (for wallet-to-wallet payments) Query to its actors, which returns the information related to the requested Instruct on Behalf Link (for wallet-to-wallet payments).

The query should support the following selection criterion:

- Instruct on Behalf Link reference.

The query should return at least the following information for one Instruct on Behalf (for wallet-to-wallet payments) Link:

- Participant BIC in Pontes giving instruct on behalf rights;
- Participant BIC in Pontes receiving instruct on behalf rights;
- Wallet ID;
- Valid from date;
- Valid to date.

Table 8.4 lists actors' permissions regarding access to the underlying data.

ID	PONTES.UR.08.400.1A
Name	Instruct on Behalf Link (for payments with direct settlement in T2 RTGS) Query
Requirement	Pontes shall provide a Instruct on Behalf Link (for payments with direct settlement in T2 RTGS) Query to its actors, which returns the information related to the requested Instruct on Behalf Link (for payments with direct settlement in T2 RTGS).

The query should support the following selection criterion:

- Instruct on Behalf Link reference.

The query should return at least the following information for one Instruct on Behalf (for payments with direct settlement in T2 RTGS) Link:

- Participant BIC in Pontes giving instruct on behalf rights;
- Participant BIC in Pontes receiving instruct on behalf rights.

Table 8.4 lists actors' permissions regarding access to the underlying data.

9 INTERFACES

Communication with Pontes is done either via user-to-application (U2A) mode or application-to-application (A2A) mode. U2A requires the provision of a GUI while A2A relies on JSON messages. The communication happens via Extended Interoperability Interface (EII).

Pontes communicates with T2 RTGS via the T2 interface via ESMIG (and ISO 20022 messages).

9.1 GENERAL REQUIREMENTS

ID	PONTES.UR.09.010.1B
Name	ESMIG interaction
Requirement	Pontes shall interact with the Eurosystem Single Market Infrastructure Gateway (ESMIG) as the only authorised channel for secure connectivity with TARGET Services. Pontes shall exchange ISO 20022 messages with the T2 backend via ESMIG.

Pontes relies on an automated interface to T2 RTGS (see T2 interface) (i) for direct settlement in T2 RTGS and (ii) for funding and defunding operations. All requests directed to T2 RTGS are channelled via the Network Service Providers (NSPs).

ID	PONTES.UR.09.020.1B
Name	Extended Interoperability Interface as Single Access Point
Requirement	Pontes shall offer a single access point via Application Programming Interface (API) for Application-to-Application communication (see chapter 9.3) and graphical user interface (GUI) for User-to-Application communication (see chapter 9.4) via Extended Interoperability Interface.

This access point shall be the sole means of secure and efficient access to Pontes functionalities for all Pontes Actors, in line with the Eurosystem's security policies. The access relies on secure connection over public Internet.

ID	PONTES.UR.09.030
Name	Standardised and secure protocols
Requirement	Pontes shall use internationally recognised standard formats for all communications with all Pontes Actors, ensuring interoperability and seamless integration. In addition, the interface shall implement robust technical standards for authentication, authorisation, and non-repudiation, providing strong security, integrity, and legal certainty for all transactions.

ID	PONTES.UR.09.040
Name	Standardised and secure connection
Requirement	Pontes shall provide one standardised interface and process for all Participants and Market DLT Operators to connect and initiate transactions through the envisaged Eurosystem interoperability mechanism (see chapter 4.2).

ID	PONTES.UR.09.050.1B
Name	User authentication
Requirement	Pontes shall perform authentication of users.

Pontes adopts a strong two-factor authentication technique to guarantee secure identification and authentication in all the interactions between users and Pontes.

For user-to-application (U2A) access, Pontes shall apply two-factor authentication (2FA) as the standard authentication mechanism, including for privileged users such as administrators, service desk operators, and auditors. All users shall be assigned a unique personal identifier for individual use only. User identifiers shall not be reassigned to another user, either concurrently or over time.

Formally documented and approved user provisioning and de-provisioning procedures shall be in place to assign, manage, and revoke user identifiers and access credentials.

ID	PONTES.UR.09.060
Name	User authorisation
Requirement	Pontes shall perform authorisation of users.

Pontes ensures that Pontes Actors are allowed to perform only actions on data within the scope of their roles and responsibilities. Access rights must be granted according to the security principles of separation of duties and least privilege. Furthermore, access rights are subject to periodical review by their asset/system owner.

Formally documented and approved user provisioning procedures are in place to assign and revoke access rights to users.

Id	PONTES.UR.09.070
Name	Validation of received input
Description	Pontes shall validate the data provided in input and reject operations for which the provided input is wrong (or missing), in relation to the defined requirements.

9.2 U2A INTERFACE

Pontes Participants granted with the appropriate privileges can communicate with Pontes in U2A mode via a web-based graphical user interface (GUI).

9.2.1 General requirements

ID	PONTES.UR.09.080
Name	User-to-application communication
Requirement	Pontes shall provide to Pontes Actors a user-to-application interface with the functionality and availability as given in this document.

Pontes shall provide U2A queries as described in PONTES.UR.09.100 and U2A operations as described in PONTES.UR.09.110.1B.

9.2.2 U2A Queries

Pontes queries available in A2A mode are also available in U2A mode.

ID	PONTES.UR.09.090.1B
Name	Query functions available in user-to-application mode
Requirement	Pontes shall provide the following queries in U2A mode: • Wallet Static Data Query; • Wallets Static Data Query; • T2 Account Reference Query; • User Query; • Wallet Balance Query; • Wallets Balance Query; • Transactions Query; • Funding and Defunding Query; • Payments with Settlement in T2 RTGS Query; Moreover, Pontes shall provide lists of Participants, Market DLT Operator and Market DLT Platforms as defined in chapter 10.2.

ID	PONTES.UR.09.100
Name	Export U2A Query responses
Requirement	Pontes shall provide Pontes Actors with the possibility to export U2A Query responses from the Graphical User Interface.

The Pontes Graphical User Interface shall foresee the possibility to export the data retrieved by the U2A Queries, e.g. in a file format.

ID	PONTES.UR.09.110.1B
Name	Query requests pending 4-eyes confirmation in user-to-application mode
Requirement	Pontes shall enable to query the requests that are pending 4-eyes confirmation.

9.2.3 Availability of U2A Functionalities

ID	PONTES.UR.09.120.1AB
Name	Functionalities available in user-to-application mode
Requirement	Pontes shall provide the following functionalities in U2A mode: • Blocking/unblocking of a Participant; • Blocking/unblocking of a Market DLT Operator; • Wallet-to-Wallet Payment; • Liquidity Transfers; • Payment with direct settlement in T2 RTGS; • Management (creation/update/deletion) of a DCW • Management (creation/update/deletion) of a Participant; • Management (creation/update/deletion) of a Market DLT Operator; • Management (creation/update/deletion) of a Market DLT Platform; • Management (creation/update/deletion) of Participant – Market DLT Operator links; • System settings change.

Such operations are possible during Pontes operating hours.

9.3 A2A INTERFACE

This chapter covers user requirements related A2A messages which have to be processed by Pontes. After some general requirements valid for all messages more detailed requirements for all messages mentioned in the process flow diagrams of preceding chapters are listed.

9.3.1 General requirements

ID	PONTES.UR.09.140.1B
Name	Application-to-application (A2A) communication and authentication
Requirement	Pontes shall provide an application-to-application (A2A) interface.

Pontes shall allow connectivity of Pontes Participants by using requests in application-to-application (A2A) mode.

For application-to-application (A2A) interactions, Pontes shall apply strong authentication based on a client identifier and mutual TLS (mTLS) using digital certificates, ensuring secure system-to-system integration.

ID	PONTES.UR.09.150.1B
Name	REST API compliance for A2A requests and responses
Requirement	Pontes shall use REST Application Programming Interface (API) for Application-to-Application communication.

ID	PONTES.UR.09.160.1B
Name	Technical validation for inbound requests
Requirement	Pontes shall perform validation on all inbound requests including at least verification of message structure, syntax, and compliance with User Detailed Functional Specification.

9.3.2 Delivery-versus-Payment-related Messages

ID	PONTES.UR.09.180.1B
Name	DvP Initialisation Request
Requirement	Pontes shall accept a DvP Initialisation Request for the purpose of initialising a DvP transaction.

The DvP Initialisation Request shall have at least the following mandatory information:

- the Debtor BIC;
- the Creditor BIC;
- the amount;
- the currency;
- the reference of the Market DLT Operator legally responsible for the settlement of the delivery leg on the Market DLT Platform⁴⁰;
- the reference of the Market DLT Platform where the delivery leg will be settled (as part of the identifier of the Market DLT Operator);
- type (DvP or PvP)

Pontes, offering a dual settlement model, shall foresee a dedicated API for the initialisation of DvP and PvP with direct settlement in T2 RTGS that foresees the same mandatory parameters.

In case of DvP and PvP with tokenised CeBM, the Seller's DCW can be provided as input. Alternatively, Pontes shall derive the Seller's DCW based on the Creditor BIC selecting the wallet with *Main flag = true*.

⁴⁰ Pontes keeps track of the list of Market DLT Platforms configured and the links among the Market DLT Operators and the Participant.

The same request is used also for PvP transactions.

ID	PONTES.UR.09.190.1B
Name	DvP Initialisation Response
Requirement	Pontes shall reply with a DvP Initialisation Response for the purpose of confirming DvP instance initialisation. The timestamp of the message shall be measured in UTC.

Upon successful DvP Initialisation, the reply sent by Pontes to the requestor will contain at least the following information:

- the DvPs reference;
- the Debtor BIC;
- the Creditor BIC;
- the amount;
- the currency;
- the reference of the Market DLT Operator legally responsible for the settlement of the delivery leg on the Market DLT Platform;
- Hash of Execution Key;
- Hash of Cancellation Key;
- the timestamp of the timeout until when the originator can instruct the DvP Payment. After the expiration of this timeout, the beneficiary (acting as Seller in the DvP) can cancel the DvP requesting Pontes to reveal the Cancellation Key (see PONTES.UR.08.120.1B);
- type (DvP or PvP).

The same response is used also for PvP transactions.

ID	PONTES.UR.09.200.1B
Name	(DvP) Get Key and Payment Information Request
Requirement	Pontes shall accept a (DvP) Get Key and Payment Information Request for the purpose of retrieving information related to a DvP (and to reveal the requested key).

The (DvP) Get Key and Information Request shall have at least the following mandatory information:

- DvP reference;
- Key type (Execution Key / Cancellation Key).

Pontes, offering a dual settlement model, shall foresee a dedicated API to Get Key and Payment Information with direct settlement in T2 RTGS that foresees the same mandatory parameters.

The same request is used also for PvP transactions.

ID	PONTES.UR.09.210.1B
Name	(DvP) Get Key and Payment Information Response
Requirement	Pontes shall reply with a (DvP) Get Key and Payment Information Response for the purpose of providing information related to a DvP (and to reveal the requested key). The timestamp of the message shall be measured in UTC.

Upon successful retrieval of the requested DvP, the reply sent by Pontes to the requestor will contain at least the following information:

- the DvP reference;
- the status (e.g., settled or rejected with rejection reason)⁴¹;
- the requested key. Execution Key is only revealed to the Buyer if the DvP Payment is Settled. Cancellation Key is only revealed to the Seller if the DvP Payment is Expired or Unsettled.
- (in case the requested key is not revealed) an error status and error reason.

The same response is used also for PvP transactions.

ID	PONTES.UR.09.220
Name	(DvP) Initialisation Query Request
Requirement	Pontes shall accept an (DvP) Initialisation Query Request for the purpose of retrieving information related to the initialisation of a DvP ⁴² .

The (DvP) Initialisation Query Request shall have at least the following mandatory information:

- DvP reference.

Pontes, offering a dual settlement model, shall foresee a dedicated API for the retrieval of an initialised DvP with direct settlement in T2 RTGS that foresees the same mandatory parameters.

The same request is used also for PvP transactions.

⁴¹ The complete list of status will be further detailed as part of the User Detailed Functional Specification (UDFS).

⁴² The same (DvP) Initialisation Query Request applies for PvP transactions.

ID	PONTES.UR.09.230.1B
Name	(DvP) Initialisation Query Response
Requirement	Pontes shall reply with a (DvP) Initialisation Query Response for the purpose of providing information related to the initialisation of a DvP ⁴³ . The timestamp of the message shall be measured in UTC.

Upon successful retrieval of the requested DvP initialisation, the reply sent by Pontes to the requestor will contain at least the following information⁴⁴:

- the DvPs reference;
- the Debtor BIC;
- the Creditor BIC;
- the amount;
- the currency;
- Hash of Execution Key;
- Hash of Cancellation Key;
- the timestamp of the timeout until when the originator can instruct the DvP Payment. After the expiration of this timeout, the beneficiary can cancel the DvP requesting Pontes to reveal the Cancellation Key;
- type (DvP or PvP).

The same response is used also for PvP transactions.

ID	PONTES.UR.09.240.1B
Name	DvP Payment Request
Requirement	Pontes shall accept a DvP Payment Request for the purpose of settling an existing DvP.

The DvP Payment Request shall have at least the following mandatory information:

- DvP reference;
- the Debtor BIC;
- the Creditor BIC;
- the amount;
- the currency.

Pontes, offering a dual settlement model, shall foresee a dedicated API for the payment of DvP and PvP with direct settlement in T2 RTGS that foresees the same mandatory parameters. Additionally, a signature is required to enable the settlement of the transactions in T2 RTGS.

⁴³ The same (DvP) Initialisation Query Response applies for PvP transactions.

⁴⁴ The case of a DvP is reported.

In case of DvP and PvP with tokenised CeBM, the Buyer's DCW can be provided as input. Alternatively, Pontes shall derive the Buyer's DCW based on the Debtor BIC selecting the wallet with *Main flag = true*.

The same request is used also for PvP transactions.

ID	PONTES.UR.09.250.1B
Name	DvP Payment Response
Requirement	Pontes shall reply with a DvP Payment Response for the purpose of confirming the settlement of a DvP Payment. The timestamp of the message shall be measured in UTC.

Upon processing the DvP Payment Request, the reply sent by Pontes to the requestor will contain at least the following information:

- the DvP reference;
- the status (e.g., settled or rejected with rejection reason)⁴⁵;
- the Execution Key (revealed only in case of successful settlement).

The same response is used also for PvP transactions.

9.3.3 Payment-versus-Payment-related Messages

ID	PONTES.UR.09.280.1B
Name	PvP Initialisation Request
Requirement	Pontes shall accept a PvP Initialisation Request for the purpose of initialising a PvP transaction.

In Pontes the request described in PONTES.UR.09.180.1B covers also PvP transactions.

ID	PONTES.UR.09.290.1B
Name	PvP Initialisation Response
Requirement	Pontes shall reply with a PvP Initialisation Response for the purpose of confirming PvP instance initialisation. The timestamp of the message shall be measured in UTC.

In Pontes the response described in PONTES.UR.09.190.1B covers also PvP transactions.

⁴⁵ The complete list of status will be further detailed as part of the User Detailed Functional Specification (UDFS).

ID	PONTES.UR.09.300.1B
Name	(PvP) Get Key and Payment Information Request
Requirement	Pontes shall accept a (PvP) Get Key and Payment Information Request for the purpose of retrieving information related to a PvP (and to reveal the requested key).

In Pontes the request described in PONTES.UR.09.200.1B covers also PvP transactions.

ID	PONTES.UR.09.310.1B
Name	(PvP) Get Key and Payment Information Response
Requirement	Pontes shall reply with a (PvP) Get Key and Payment Information Response for the purpose of providing information related to a PvP (and to reveal the requested key). The timestamp of the message shall be measured in UTC.

In Pontes the response described in PONTES.UR.09.210.1B covers also PvP transactions.

ID	PONTES.UR.09.320.1B
Name	PvP Payment Request
Requirement	Pontes shall accept a PvP Payment Request for the purpose of settling an existing PvP.

In Pontes the request described in PONTES.UR.09.240.1B covers also PvP transactions.

ID	PONTES.UR.09.330.1B
Name	PvP Payment Response
Requirement	Pontes shall reply with a PvP Payment Response for the purpose of confirming the settlement of a PvP Payment. The timestamp of the message shall be measured in UTC.

In Pontes the response described in PONTES.UR.09.250.1B covers also PvP transactions.

9.3.4 Wallet-to-Wallet Payment-related Messages

ID	PONTES.UR.09.340.1B
Name	Wallet-to-Wallet Payment Request
Requirement	Pontes shall accept a Wallet-to-Wallet Payment Request for the purpose of settling a Wallet-to-Wallet Payment.

The Wallet-to-Wallet Payment Request shall have at least the following mandatory information:

- Wallet-to-Wallet Payment reference;
- the Debtor BIC;
- the Debtor DCW;
- the Creditor BIC;
- the Creditor DCW;

- the amount;
- the currency.

ID	PONTES.UR.09.350.1B
Name	Wallet-to-Wallet Payment Response
Requirement	Pontes shall reply with a Wallet-to-Wallet Payment Response for the purpose of confirming the settlement of a Wallet-to-Wallet Payment. The timestamp of the message shall be measured in UTC.

Upon processing the Wallet-to-Wallet Payment Request, the reply sent by Pontes to the requestor will contain at least the following information:

- the Wallet-to-Wallet Payment reference;
- the status (e.g., settled or rejected);
- the settlement timestamp (if available).

ID	PONTES.UR.09.360
Name	Wallet-to-Wallet Payment Status Query Request
Requirement	Pontes shall accept a Wallet-to-Wallet Payment Status Query Request for the purpose of retrieving information related to a Wallet-to-Wallet Payment.

The Wallet-to-Wallet Payment Status Query Request shall have at least the following mandatory information:

- Wallet-to-Wallet Payment reference.

ID	PONTES.UR.09.370.1B
Name	Wallet-to-Wallet Payment Status Query Response
Requirement	Pontes shall reply with a Wallet-to-Wallet Payment Status Query Response for the purpose of providing information related to a Wallet-to-Wallet Payment. The timestamp of the message shall be measured in UTC.

Upon successful retrieval of the requested Wallet-to-Wallet Payment, the reply sent by Pontes to the requestor will contain at least the following information:

- the Wallet-to-Wallet Payment reference;
- the status (e.g., settled or rejected);
- the settlement timestamp (if available)
- the debtor BIC;
- the debtor wallet;
- the creditor BIC;
- the creditor wallet;
- the amount;
- the currency.

9.3.5 Payment with direct settlement in T2 RTGS-related Messages

ID	PONTES.UR.09.440.1A
Name	Payment with direct settlement in T2 RTGS Request
Requirement	Pontes shall accept a Payment with direct settlement in T2 RTGS Request for the purpose of settling a direct T2 RTGS Payment.

The Payment with direct settlement in T2 RTGS Request shall have at least the following mandatory information:

- the Payment with direct settlement in T2 RTGS reference;
- the Payer Bank;
- the Receiver Bank;
- the amount;
- the currency;
- the signature (required to enable the settlement of the transactions in T2 RTGS).

ID	PONTES.UR.09.450.1A
Name	Payment with direct settlement in T2 RTGS Response
Requirement	Pontes shall reply with a Payment with direct settlement in T2 RTGS Response for the purpose of confirming the settlement of a direct T2 RTGS Payment. The timestamp of the message shall be measured in UTC.

Upon processing the Payment with direct settlement in T2 RTGS Request, the reply sent by Pontes to the requestor will contain at least the following information:

- the Payment with direct settlement in T2 RTGS reference;
- the status (e.g., settled or rejected);
- the settlement timestamp (if available).

ID	PONTES.UR.09.460.1A
Name	Payment with direct settlement in T2 RTGS Status Query Request
Requirement	Pontes shall accept a Payment with direct settlement in T2 RTGS Status Query Request for the purpose of retrieving information related to a Payment with direct settlement in T2 RTGS.

The Payment with direct settlement in T2 RTGS Status Query Request shall have at least the following mandatory information:

- Payment with direct settlement in T2 RTGS reference.

ID	PONTES.UR.09.470.1A
Name	Payment with direct settlement in T2 RTGS Status Query Response
Requirement	Pontes shall reply with a Payment with direct settlement in T2 RTGS Status Query Response for the purpose of providing information related to a Payment with direct settlement in T2 RTGS. The timestamp of the message shall be measured in UTC.

Upon successful retrieval of the requested Payment with direct settlement in T2 RTGS, the reply sent by Pontes to the requestor will contain at least the following information:

- the Payment with direct settlement in T2 RTGS reference;
- the status (e.g., settled or rejected);
- the settlement timestamp (if available)
- the debtor BIC;
- the creditor BIC;
- the amount;
- the currency.

9.3.6 Payment Free of Delivery-related Messages

ID	PONTES.UR.09.480.1A
Name	PFoD DELI leg Initialisation Request
Requirement	Pontes shall accept a PFoD DELI leg Initialisation Request for the purpose of creating a direct PFoD DELI leg.

The PFoD DELI leg Initialisation Request shall have at least the following mandatory information:

- the PFoD reference (tradeID);
- the Seller's BIC;
- the amount;
- the currency (Euro);
- the type (DELI).

In case the Seller has more than one DCW, the Seller's DCW has to be provided as input.

ID	PONTES.UR.09.490.1A
Name	PFoD DELI leg Initialisation Response
Requirement	Pontes shall reply with a PFoD DELI leg Initialisation Response for the purpose of confirming the processing of a PFoD DELI leg Initialisation Request.

Upon processing the PFoD DELI leg Initialisation Request, the reply sent by Pontes to the requestor will contain the result of the processing.

ID	PONTES.UR.09.500.1A
Name	PFoD RECE leg Initialisation Request
Requirement	Pontes shall accept a PFoD RECE leg Initialisation Request for the purpose of creating a direct PFoD RECE leg.

The PFoD RECE leg Initialisation Request shall have at least the following mandatory information:

- the PFoD reference (tradeID);
- the Buyer's BIC;
- the amount;
- the currency (Euro);
- the type (RECE).

In case the Buyer has more than one DCW, the Buyer's DCW has to be provided as input.

ID	PONTES.UR.09.510.1A
Name	PFoD RECE leg Initialisation Response
Requirement	Pontes shall reply with a PFoD RECE leg Initialisation Response for the purpose of confirming the processing of a PFoD RECE leg Initialisation Request.

Upon processing the PFoD RECE leg Initialisation Request, the reply sent by Pontes to the requestor will contain the result of the processing.

9.3.7 Liquidity Transfer-related Messages

The Pontes service processes incoming requests for liquidity transfers.

ID	PONTES.UR.09.380.1B
Name	Liquidity Transfer Request
Requirement	Pontes shall accept a Liquidity Transfer Request for the purpose of settling funding and defunding operations.

The Liquidity Transfer Request shall have at least the following mandatory information:

- the wallet to be credited;
- the wallet to be debited;
- the amount;
- the currency (Euro);
- the signature (required to enable the settlement of the transactions in T2 RTGS);
- the type (funding or defunding)

In case of:

- Funding, the wallet to be debited is the Token Issuance Wallet;
- Defunding, the wallet to be credited is the Token Issuance Wallet.

Moreover, the Liquidity Transfer Request shall include, as a minimum, all mandatory data elements defined for the relevant pain ISO 20022 message used (see Ancillary System Settlement Procedure E).

ID	PONTES.UR.09.390.1B
Name	Liquidity Transfer Response
Requirement	Pontes shall reply with a Liquidity Transfer Response for the purpose of confirming the settlement of funding and defunding operations. The timestamp of the message shall be measured in UTC.

Upon processing a Liquidity Transfer Request, the reply sent by Pontes to the requestor will contain at least the outcome of the funding or defunding operation.

ID	PONTES.UR.09.400.1B
Name	Liquidity Transfer Status Query Request
Requirement	Pontes shall accept a Liquidity Transfer Status Query Request for the purpose of retrieving information related to a funding or defunding operation.

The Liquidity Transfer Status Query Request shall have at least the following mandatory information:

- Liquidity Transfer reference.

ID	PONTES.UR.09.410.1B
Name	Liquidity Transfer Status Query Response
Requirement	Pontes shall reply with a Liquidity Transfer Status Query Response for the purpose of providing information related to a Liquidity Transfer. The timestamp of the message shall be measured in UTC.

Upon successful retrieval of the requested Liquidity Transfer, the reply sent by Pontes to the requestor will contain at least the following information:

- Liquidity transfer reference;
- Settlement timestamp (if available);
- Amount;
- Currency (Euro);
- Status;
- the wallet debited;
- the wallet credited;
- the type (funding or defunding).

In case of:

- Funding, the wallet to be debited is the Token Issuance Wallet;
- Defunding, the wallet to be credited is the Token Issuance Wallet.

ID	PONTES.UR.09.520.2
Name	T2 RTGS reply message
Requirement	Pontes shall process reply messages received from T2 RTGS in the context of Ancillary System settlement under Procedure E (see ASInitiationStatus (pain.998) as described in T2 RTGS User Detailed Functional Specification (UDFS)). These messages shall be ISO 20022-compliant and shall indicate the acceptance or rejection of the transaction in the context of funding and defunding operations ⁴⁶ .

ID	PONTES.UR.09.530.1A
Name	Wallet-to-Wallet Transfer Request
Requirement	Pontes shall accept a Wallet-to-Wallet Transfer Request for the purpose of settling a wallet-to-wallet transfer.

The Wallet-to-Wallet Transfer Request shall have at least the following mandatory information:

- the wallet to be credited;
- the wallet to be debited;
- the amount;
- the currency (Euro);
- the type (transfer).

In case of transfer, the wallet to be credited and the wallet to be debited belong to the same Participant.

ID	PONTES.UR.09.540.1A
Name	Wallet-to-Wallet Transfer Response
Requirement	Pontes shall reply with a Wallet-to-Wallet Transfer Response for the purpose of confirming the settlement of a Wallet-to-Wallet Transfer. The timestamp of the message shall be measured in UTC

Upon processing the Wallet-to-Wallet Transfer Request, the reply sent by Pontes to the requestor will contain at least the following information:

- the Wallet-to-Wallet Transfer reference;
- the wallet credited;
- the wallet debited;
- the status (e.g., settled or rejected);
- the settlement timestamp (if available).

⁴⁶ The same message is used in the processing of transactions with direct settlement in T2 RTGS.

10 OTHER FUNCTIONS

For Pontes functionalities such as the management of the business day and billing don't rely on TARGET Common Components. These functionalities are managed by the Eurosystem DLT or via operational procedures.

10.1 BILLING

ID	PONTES.UR.10.040.1B
Name	Data for billing purposes
Requirement	Pontes shall enable the extraction of data for billing purposes. The generation and submission of invoices rely on operational procedures.

Billable items per Participant are (non-exhaustive list):

1. Number of settled and unsettled payment related to DvP and PvP transactions with tokenised CeBM;
2. Number of settled and unsettled wallet-to-wallet payments with tokenised CeBM;
3. Number of settled and unsettled PFoD with tokenised CeBM;
4. Number of settled and unsettled payment related to DvP and PvP transactions with direct settlement in T2 RTGS;
5. Number of settled and unsettled with direct settlement in T2 RTGS;
6. Number of settled and unsettled liquidity transfers;
7. Number of owned wallets.

Billable items per Market DLT Operator are (non-exhaustive list):

1. Number of settled and unsettled payment related to DvP and PvP transactions with tokenised CeBM;
2. Number of settled and unsettled wallet-to-wallet payments with tokenised CeBM;
3. Number of settled and unsettled PFoD with tokenised CeBM;
4. Number of settled and unsettled payment related to DvP and PvP transactions with direct settlement in T2 RTGS;
5. Number of settled and unsettled with direct settlement in T2 RTGS.

The operational procedures shall include mechanisms to prevent a transaction from being considered for billing purposes for both a Participant and the relevant Market DLT Operator.

Further details will be specified in the User Detailed Functional Specifications (UDFS).

10.2 LISTS

ID	PONTES.UR.10.060.1B
Name	List of Participants in Pontes
Requirement	Pontes shall enable to query the list of Participants and Central Banks configured in Pontes.

In order to provide Pontes Operator, Central Banks and Participants with a list of Central Banks and Participants configured in Pontes, a table has to be maintained. This list can be queried by Pontes Operator, Central Banks and Participants.

ID	PONTES.UR.10.110.1A
Name	List of Market DLT Operators in Pontes
Requirement	Pontes shall enable to query the list of Market DLT Operators configured in Pontes.

In order to provide Pontes Operator, Central Banks and Participants with a list of Market DLT Operators configured in Pontes, a table has to be maintained. This list can be queried by Pontes Operator, Central Banks and Participants.

ID	PONTES.UR.10.120.1A
Name	List of Market DLT Platforms in Pontes
Requirement	Pontes shall enable to query the list of Market DLT Platforms configured in Pontes.

In order to provide Pontes Operator, Central Banks and Participants with a list of Market DLT Platforms configured in Pontes, a table has to be maintained. This list can be queried by Pontes Operator, Central Banks and Participants.

10.3 BUSINESS DAY MANAGEMENT

ID	PONTES.UR.10.130.2
Name	Operating days
Requirement	Pontes is open for settlement in line with the calendar of T2 RTGS for the euro currency.

ID	PONTES.UR.10.140.2
Name	Operating schedule
Requirement	Pontes is open for settlement for 22,5 hours a day for 5 days from Monday to Friday (from 19:30 to 18:00 of the following calendar day - see RTGS RTS I and RTGS RTS II) ⁴⁷ .

RTGS RTS I is defined as real-time settlement I period in the RTGS, which supports the settlement of (i) liquidity transfer orders and (ii) ancillary system transfer orders. RTGS RTS II is defined as real-time settlement II period in the RTGS, which supports the settlement of (i) liquidity transfer orders, (ii) ancillary system transfer orders, (iii) interbank payment orders and (iv) customer payment orders.

Pontes' operational business day⁴⁸ is split in different "business windows" and is managed by the Pontes Operator. Each business window has a *start time* and *end time* (configured by the Pontes Operator) where specific actions and processes are allowed:

- Start of Day (SoD)
- Open for all
- End of Day (EoD)
- Closed
- Maintenance window.

During the weekdays, the maintenance window (MW) is optional and, if activated, it runs from 03:00 until 05:00.

The non-optional maintenance window (MW) takes place weekly from 02:30 Saturday until 02:30 Monday. For TARGET closing days for the Euro currency, the non-optional maintenance window is extended to include those days, starting at 02:30 on the closing day (e.g. Good Friday) and ending at 02:30 on the next TARGET working day (e.g. the following Tuesday after Easter).

- If the non-optional maintenance window (MW) is activated in T2 RTGS, it shall be activated in Pontes as well,
- If the non-optional maintenance window (MW) is activated in Pontes, no mandatory activation of the non-optional maintenance window (MW) is foreseen in T2 RTGS.

During the maintenance window (optional and non-optional), Pontes is not available for settlement or liquidity management operations⁴⁹.

Further details on the operating schedule and on the configuration of business windows shall be provided in the relevant User Detailed Functional Specifications (UDFS).

⁴⁷ [TARGET Systems operating schedule](#). Further changes are subject to the Eurosystem policy decisions on the extension of T2 operating hours.

⁴⁸ No integration with TARGET Services Common Component Business Day Management (BDM) nor change of business date triggered by T2 is foreseen for Pontes.

⁴⁹ Tokenised CeBM can be kept in the DCWs during the maintenance window (optional and non-optional). Mandatory End-of-Day defunding is foreseen only at the end of the Pontes business day when the service is closed.

11 NON-FUNCTIONAL REQUIREMENTS

11.1 ACCESS

Id	PONTES.NFR.11.010
Name	Access conditions
Description	Pontes shall ensure equal access for all Participants (and Market DLT Operators) meeting the eligibility criteria defined by the Eurosystem.

From the technical point of view, access for all Participants (and Market DLT Operators) shall be non-discriminatory. The Central Banks are responsible for checking the eligibility their Participants (and Market DLT Operators).

11.2 AVAILABILITY

Id	PONTES.NFR.11.020.1B
Name	Availability
Description	Pontes shall enable settlement of transactions in tokenised CeBM and in CeBM in T2 RTGS in alignment with T2 RTGS operational day schedule ⁵⁰ for the Euro currency.

Id	PONTES.NFR.11.030.1B
Name	Service availability
Description	Pontes unplanned downtime, calculated on a monthly basis, corresponds to an availability of 99.7%. In this context, Pontes is deemed to be unavailable when no participant can access its functionalities

In case of incidents or failures, Pontes can face temporary and unplanned interruption of service.

ID	PONTES.NFR.11.040
Name	Real-time monitoring of the service
Requirement	Pontes shall implement real-time monitoring of the service (including the nodes of the Eurosystem DLT) and network health, performance, and connectivity. Automated alerts and escalation procedures shall be established to enable rapid detection and response to anomalies, outages, or security incidents affecting nodes of the network.

⁵⁰ This materialises in 22,5 hours a day for 5 days from Monday to Friday (from 19:30 to 18:00 of the following calendar day - see PONTES.UR.10.140.2).

Id	PONTES.NFR.11.050.1B
Name	Maintenance and upgrades
Description	Pontes may envisage temporary stop of service in case of exceptional changes only.

Pontes operates for 22,5 hours a day for 5 days from Monday to Friday and may require planned service interruptions to perform maintenance, updates, or upgrades. Such interruptions shall be minimised and, where applicable, announced in advance according to the operational and governance arrangements, with the objective of limiting the impact on participants.

11.3 DISASTER RECOVERY

Id	PONTES.NFR.11.280.1A
Name	Component fault tolerance
Description	The different component of Pontes shall rely on infrastructure-based resiliency, implemented across the different hosting regions. Each region foresees different sites and leverages distributed storage (and data replication ⁵¹), ensuring intra-region high availability.

Id	PONTES.NFR.11.290.1A
Name	Operational site location
Description	Pontes shall be hosted in multiple operational sites at locations that ensure the defined availability and performance.

Id	PONTES.NFR.11.300.1A
Name	Local disaster fault tolerance
Description	Pontes shall tolerate hardware or software failures caused by local disasters so that overall performance and availability is still provided as intended. Local disasters refer to damaging events occurring in specific a limited area, like fires, flooding, or power outages.

⁵¹ Cross-region redundancy is not implemented in Pontes.

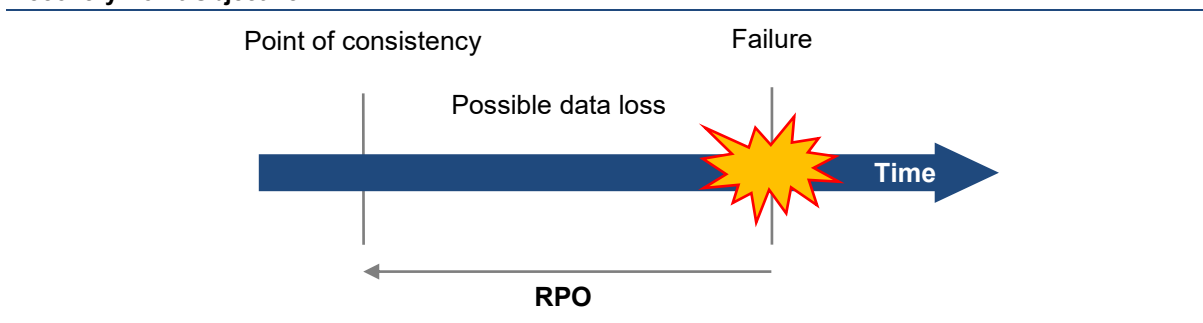
11.3.1 Recovery Point Objective

Id	PONTES.NFR.11.060.1B
Name	Recovery Point Objective (RPO)
Description	At infrastructure level, Pontes shall ensure a recovery point objective (RPO) of zero minute in the event of a site failure for every component needed to provide the critical service.

The recovery point objective (RPO) is a point of consistency to which a user wants to recover or restart the service. It is measured as the amount of time between the moment when the point of consistency was created and the moment when the failure occurred.

Pontes ensures synchronous point of consistency creations and, as a consequence, no data loss in case of failures.

Figure 11.1
Recovery Point Objective

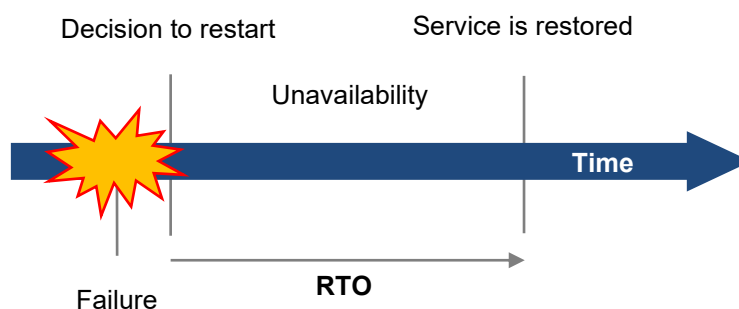


11.3.2 Recovery Time Objective

Id	PONTES.NFR.11.070.1B
Name	Recovery Time Objective (RTO)
Description	At infrastructure level, Pontes shall ensure a recovery time objective (RTO) for a site failure of 60 minutes, for every component needed to provide the critical service.

The recovery time objective (RTO) is the maximum amount of time required for recovery or restart of the service to a specified point of consistency. Where there is a site failure, it shall be ensured a maximum time of unavailability of one hour starting from the moment when the decision to restart the component is made until the moment the component is restored.

Figure 11.2
Recovery Time Objective



11.4 ARCHIVING

Id	PONTES.NFR.11.080.1B
Name	Archiving for legal purposes of transactional data
Description	The Pontes shall ensure to store and enable the retrieval of transactional data and not older than ten years, upon request by authorized actors for legal purposes.

Transactional data include archived transactions (e.g. DvPs, PvpPs, wallet-to-wallet payments, PFoD, liquidity transfers) for legal purposes. After the data extraction, the content shall be made available to the requestor, e.g. in a file format.

Id	PONTES.NFR.11.090.1B
Name	Archiving for legal purposes of reference data
Description	The Pontes shall ensure to store and enable the retrieval of reference data not older than ten years, upon request by authorized actors for legal purposes.

Archived reference data (creation, update, deletion) and system parameters (creation, update, deletion) shall be extracted from the secure archive storage. After the data extraction, the content shall be made available to the requestor, e.g. in a file format.

Id	PONTES.NFR.11.100.1B
Name	Archiving of authentication and security data
Description	The Pontes Operator shall be able to retrieve authentication and security data not older than three months, upon request by authorised actors.

Archived authentication and security data shall be extracted from the offline repository. After the data extraction, the content shall be made available to the requestor, e.g. in a file format.

11.5 AUDIT TRAIL

Id	PONTES.NFR.11.110.1B
Name	Comprehensive Audit Trail
Description	Pontes shall collect and store in logs immutably and with precise timestamps all relevant actions, actors and events, including but not limited to transaction processing, liquidity management operations, system and node configuration (e.g. connection, disconnection), and user accesses and activities.

Pontes shall provide a secure audit trail for actions (including manual entry(-ies), data consultations, etc.) initiated by a user or by a component.

Pontes stores in audit logs the user activity, exceptions and information security events to assist in the access control monitoring performed by the Pontes Operator. Logging facilities and log information is protected against tampering and unauthorised access. Activities performed by privileged users (administrators, service desk operators, auditors, etc.) are also be logged.

Audit trail information to be collected and stored includes the following data:

- transaction records,
- authentication successes and failures of all users,
- security related messages (e.g. changes of access rights, alerts and exceptional events).

Audit trail records contain registration timestamps and, when relevant, the identifier of the user who performed the recorded action.

11.6 INFORMATION SECURITY

Id	PONTES.NFR.11.120
Name	Information security compliance
Description	Pontes shall comply with the TARGET Services Security Requirements and Controls ⁵² , ensuring the confidentiality and integrity of all data and services.

11.7 CYBER RESILIENCE

Id	PONTES.NFR.11.130
Name	Cyber resilience compliance
Description	Pontes shall comply with the TARGET Services Cyber Resilience and Information Security (CRIS) Framework ⁵³ .

11.8 VOLUMETRIC ASSUMPTIONS

11.8.1 Payment leg processing throughput

Id	PONTES.NFR.11.140.1B
Name	Payment leg processing throughput average
Description	Pontes shall enable to process an average of 10 incoming A2A transactions per second.

In this context, *transaction* means the processing of the payment leg on the Eurosystem DLT:

- independently of the type of transaction (i.e. it refers to the payment on the Eurosystem DLT in case of DvP, Pvp, PfoD and wallet-to-wallet payment),
- independently of the successful outcome of the transaction,
- independently of the location of the Central Banks nodes involved,
- excluding any initialisation step, where relevant.

⁵² The latest version of the TARGET Services Security Requirements and Controls was approved by the Governing Council on 01 February 2024 (SEC/GovC/X/24/023, SEC/GovC/X/24/023a). The security requirements and controls could be updated to reflect the technical and architectural characteristics of the Pontes.

⁵³ The TARGET Services Cyber Resilience and Information Security Framework was approved by the Governing Council on 01 February 2024 (SEC/GovC/X/24/023, SEC/GovC/X/24/023b). The framework could be updated to reflect the technical and architectural characteristics of Pontes.

11.8.2 Payment leg execution time

Id	PONTES.NFR.11.150.1B
Name	Payment leg execution time
Description	Pontes shall ensure processing the transactions within 5 seconds for 95% of the processed A2A transactions and within 2 minutes for 100% of the processed A2A transactions.

In this context, *transaction* means the processing of the payment leg on the Eurosystem DLT:

- independently of the type of transaction (i.e. it refers to the payment on the Eurosystem DLT in case of DvP, PVP, PFoD and wallet-to-wallet payment),
- independently of the successful outcome of the transaction,
- independently of the location of the Central Banks nodes involved,
- excluding any initialisation step, where relevant.

Such execution time shall be calculated from the time Pontes receives the payment request from the Participant (or Market DLT Operator) to the time Pontes sends the response to the Participant (or Market DLT Operator).

11.8.3 Query response time

Id	PONTES.NFR.11.160.1B
Name	Real-time query response time – A2A
Description	Pontes shall process 95% of the A2A real-time queries within 30 seconds and 100% of the A2A real-time queries within 5 minutes. Whereby the response time is measured as the elapsed time between the moment an A2A query request is received by the interface and the moment the query result is returned to the requestor.

Id	PONTES.NFR.11.170.1B
Name	Real-time query response time – U2A
Description	Pontes shall process 95% of the U2A real-time queries within 30 seconds and 100% of the U2A real-time queries within 5 minutes. Whereby the response time is measured as the elapsed time between the moment an U2A query request is received by the interface and the moment the query result is returned to the requestor.

11.8.4 Scalability

Id	PONTES.NFR.11.180.1B
Name	Scalability
Description	Pontes shall be designed to scale up, with no impact on the (payment leg) execution time. Pontes shall enable to process an increase of workload up to 20% higher than the payment leg processing throughput average, as defined in this document (see PONTES.NFR.11.140.1B).

11.9 SERVICE DESK

Id	PONTES.NFR.11.190
Name	Service Desk
Description	A Service Desk shall be available at the Pontes Operator to respond to any operational and technical issue concerning the Pontes service.

The Pontes Service Desk shall be the single point of contact for any kind of operational and technical issues concerning the Pontes service.

The Pontes Service Desk shall be responsible for providing direct support to Central Banks, Pontes Participants and Market DLT Operators for managing the technical connection, also during the non-standard service hours.

Central Banks shall maintain vis-à-vis their own community of Pontes Participants and Market DLT Operators the responsibility of e.g. the reference data setup and liquidity management during the standard service hours.

ID	PONTES.NFR.11.200
Name	Service Desk Availability
Requirement	The Pontes Service Desk shall be available both on-site during standard service hours and on-call during non-standard service hours with different service levels.

The Pontes Service Desk shall be available according to the following service hours:

- from 6:30 to 19:30: standard service hours;
- from 19:30 to 6:30 (and on T2 closing days for the Euro currency): non-standard service hours.

ID	PONTES.NFR.11.210
Name	Contacting the Service Desk
Requirement	Pontes Service Desk shall be reachable via telephone and e-mail.

The communication between the Pontes Service Desk and Central Banks responsible for Pontes Participants shall be based on the use of telephone and e-mail.

ID	PONTES.NFR.11.220
Name	Trouble Management System
Requirement	The Pontes Service Desk shall be supported by a Trouble Management System (TMS).

The Pontes Service Desk shall be supported by a Trouble Management System (TMS). All activities of the Pontes Operator related to IT Service Management processes shall be supported by the TMS, which covers the workflow and serves as information base providing, e.g., the status of an incident/problem, the actors involved and details about reasons and solutions.

11.10 CLOCK SYNCHRONISATION

Id	PONTES.NFR.11.240
Name	Clock reference
Description	Pontes shall use atomic clock time as a reference.

Pontes uses a clock synchronised to an atomic clock time (in UTC, Coordinated Universal Time, with a maximum deviation of 100 milliseconds).

11.11 CHANGE AND RELEASE MANAGEMENT

ID	PONTES.NFR.11.260.1B
Name	Change and Release Management (CRM) process
Requirement	Pontes shall support the possibility of a Change and Release Management (CRM) process ensuring controlled, transparent, and efficient updates to the service with the objective of restricting Change Requests to mandatory and/or regulatory changes and requiring Market Infrastructure Board (MIB) approval for any Change Request arising from new functional requirements.

12 STATISTICAL INFORMATION

Pontes provides a set of statistical indicators. The data shall be extracted by the Pontes Operator on a monthly basis and then provided to the Central Banks. The ECB should receive the data for publication on the website.

Id	PONTES.UR.12.010.1B
Name	Pontes availability for creation of Statistical Information data
Description	Pontes shall enable the extraction of the statistical information data.

The creation of the statistical information reports is available for the Pontes Operator and is executed on the basis of the latest available data present in Pontes. It shall be possible to extract data on monthly basis.

Id	PONTES.UR.12.020.1B
Name	General Transactions
Description	A dashboard, available to the ECB via a Graphical User Interface, shall include general information on volumes and values of transactions exchanged on Pontes at aggregate level.

The general information contains, at least, the following indicators:

- Number (and amount) of funding operations;
- Number (and amount) of defunding operations;
- Number (and amount) of settled transactions (with settlement in tokenised CeBM);
- Number of unsettled transactions (with settlement in tokenised CeBM).

The data is related to the current business date, and it's updated automatically on a regular basis (or at the request of the user).

Id	PONTES.UR.12.030.1B
Name	National Transactions
Description	A dashboard, available to every Central Bank via a Graphical User Interface shall include general information on volumes and values of transactions exchanged on Pontes, relevant to all the wallets of a given Central Bank.

The national transactions are grouped by the participants' Central Bank and contain, at least, the following indicators:

- Number (and amount) of funding operations, for the wallets of the participants of a given Central Bank;
- Number (and amount) of defunding operations for the wallets of the participants of a given Central Bank;
- Number (and amount) of settled transactions (with settlement in tokenised CeBM) for the wallets of the participants of a given Central Bank;
- Number of unsettled transactions (with settlement in tokenised CeBM) for the wallets of the participants of a given Central Bank.

The data is related to the current business date, and it's updated automatically on a regular basis (or at the request of the user).

Id	PONTES.UR.12.100
Name	Data for publication of the traffic settled in the TARGET Services
Description	Pontes shall provide monthly data required for publication of the traffic settled in the TARGET Services.

As part of TARGET Services and in line with Principles for Financial Market Infrastructures (PFMI) and Systemically Important Payment Systems (SIPS) regulation, Pontes shall provide monthly data related to the traffic settled. This shall support the publication on the [ECB website](#).

The creation and publication of these statistics shall follow the structure of data of the existing TARGET Services, e.g. volume and value (daily average and total) figures per each month and each year of operation.

13 ANNEX

13.1 LIST OF EXTERNAL DOCUMENTS

	Title	Source
[1]	Central Security Depository Regulation	Central Security Depository Regulation
[2]	DLT Pilot Regime Regulation	DLT Pilot Regime Regulation
[3]	European Market Infrastructure Regulation - 648/2012	European Market Infrastructure Regulation - 648/2012
[4]	Markets in financial instruments directive (MiFID)	Markets in financial instruments directive (MiFID)
[5]	Open API Specification	Open API Specification
[6]	Technology Readiness Levels	Technology Readiness Levels
[7]	TARGET Guideline	TARGET Guideline

13.2 GLOSSARY

Item	Description	Source
A2A	See Application-to-Application	ECB
Ancillary System	A system in which payments and/or financial instruments are exchanged and/or cleared or recorded, while the ensuing monetary obligations are settled in another system, typically an RTGS system.	ECB
Application-to-Application	A technical mode of communication that permits the exchange of information between different software applications without a graphical user interface.	ECB
AS	See Ancillary System	ECB
Business Identifier Code	An international standard for identification of institutions within the financial services industry. It consists of eight or eleven contiguous characters, comprising a financial institution code (four characters), a country code (two characters), a location code (two characters) and, optionally, a branch code (three characters).	ECB
CeBM	See Central Bank Money	ECB
Central Bank Money	Liabilities of a central bank, in the form of either banknotes or bank deposits held at a central bank, which can be used for settlement purposes.	ECB
Eurosistem	The central banking system of the euro area. It comprises the ECB and the national central banks of those EU Member States whose currency is the euro.	ECB
Extensible Markup Language	(XML) An open standard developed and maintained by World Wide Web Consortium (W3C), for describing and structuring data for the transmission and exchange of information between computer applications and organisations / humans.	ECB

ISO 20022	The international standard for financial services messaging, maintained by the International Organisation for Standardisation.	ECB
Liquidity transfer	An instruction to transfer CeBM from a DCA in T2 RTGS to a DCW in ESY DLT or from a DCW on ESY DLT to a DCA in T2 RTGS or between two DCWs (belonging to the same Participant) on ESY DLT.	ECB
National Central Bank	A Central Bank that provides DCW services to Participants for settlement of transactions in tokenised CeBM on ESY DLT or DCA in T2 RTGS for direct settlement in CeBM.	ECB
Recovery Point Objective	The recovery point objective (RPO) is a point of consistency to which a user wants to recover or restart the service.	ECB
Recovery Time Objective	The recovery time objective (RTO) is the maximum amount of time required for recovery or restart of the service to a specified point of consistency.	ECB
T2	The Eurosystem's single shared platform enabling the settlement of payments in CeBM in Europe, supporting the implementation of the Eurosystem's monetary policy.	ECB
Timestamp	A timestamp is a sequence of characters, denoting the date and/or time at which a certain event occurred.	ECB
Pontes Operator	The Pontes Operator is the entity that operates the Pontes service.	ECB
U2A	See user-to-application	ECB
User Requirement	A condition or capability needed by a stakeholder to solve a problem or achieve an objective.	ECB
User Requirements Document	The document setting out the user requirements of a service.	ECB
User-to-application	A mode of technical communication that permits the exchange of information between software applications of Pontes and a Pontes system user through a graphical user interface.	ECB
Dedicated Cash Wallet	An account holding tokenised CeBM on ESY DLT for the purpose of settling transactions and liquidity transfers.	ECB

13.3 LIST OF ACRONYMS

Item	Description
24/7/365	24-hour and seven-day around the year
A2A	Application-to-Application
API	Application Programming interface
CMB	Credit Memorandum Balance
CSD	Central Securities Depositories
CSDR	Central Securities Depositories Regulation
CCPs	Central Counter Parties
DCA	Dedicated Cash Account
DCW	Dedicated Cash Wallet
DLT	Distributed Ledger Technology
DSS	DLT settlement system
DTSS	DLT Trading and Settlement System
DvP	Delivery-versus-Payment
EEA	European Economic Area
EoD	End of Day
ESMIG	European Single Market Infrastructure Gateway
HLC	Hash Link Contract
HTTP	Hyper Text Transfer Protocol
MiFID	Markets in Financial Instruments Directive
OAS	Open API Specification
Pontes DCW	See DCW
PvP	Payment-versus-Payment
REST	Representational State Transfer
RPO	Recovery Point Objective
RTGS	Real Time Gross Settlement system
RTO	Recovery Time Objective
U2A	User-to-Application
UTC	Coordinated Universal Time
TIA	Token Issuance Account
XML	Extensible Markup Language