

Secending Chain

André Leal • BdP

12 November 2020

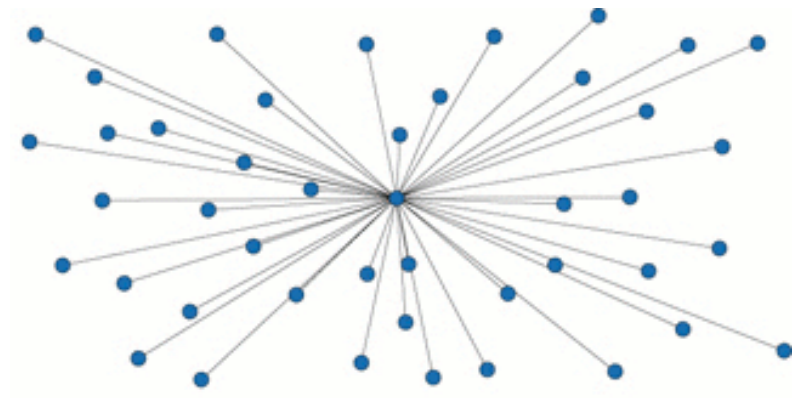
2020 EBA Policy Research Workshop



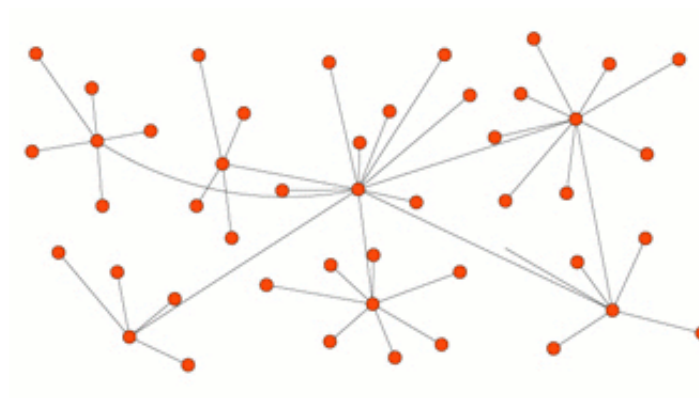
BANCO DE
PORTUGAL
EUROSYSTEM

- 1. Blockchain – The value of Trust**
- 2. The road to SecLending Chain**
- 3. The Experimentation**
- 4. Achievements**

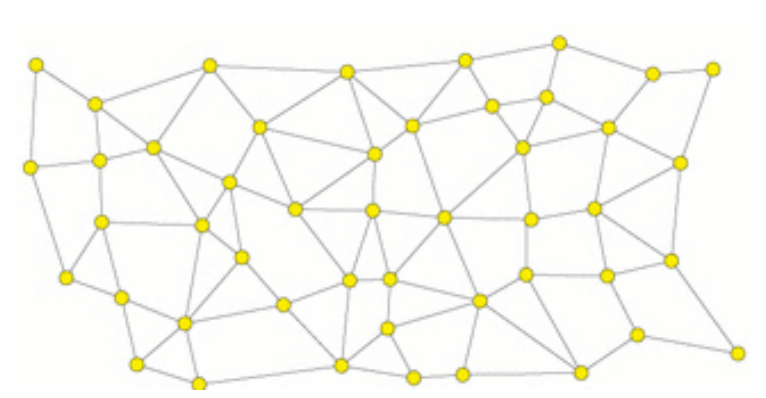




Centralized



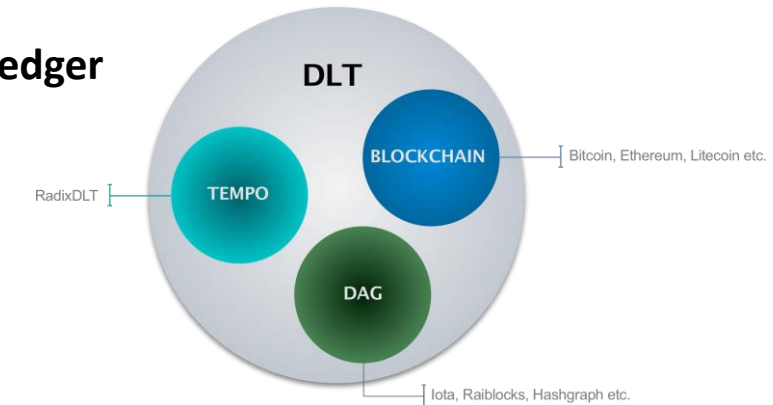
Decentralized



Distributed
Ledger Technology

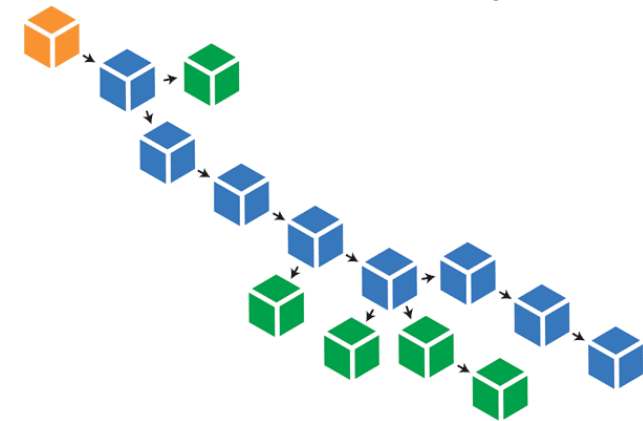
DLT (Distributed Ledger Technology)

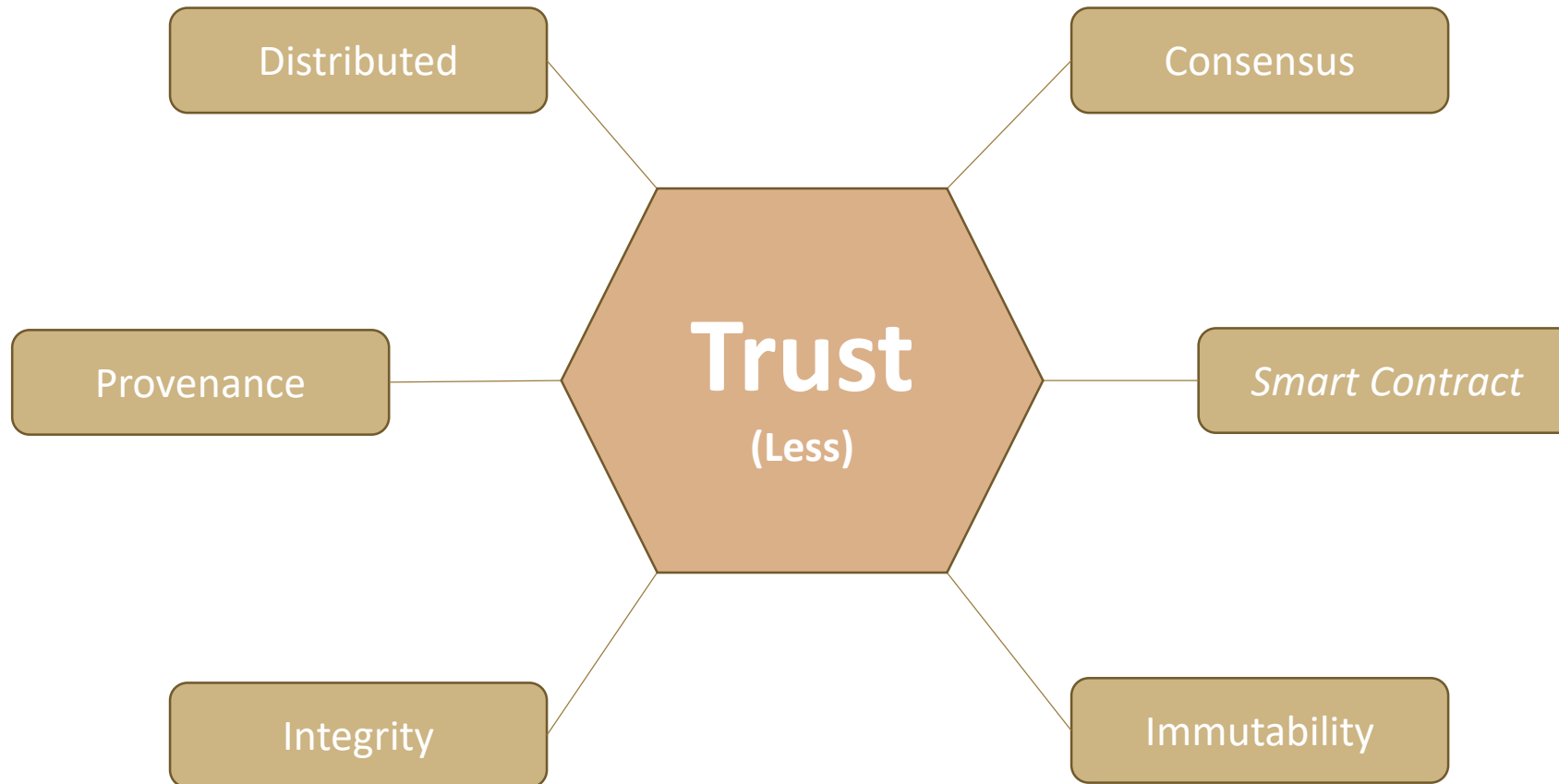
- **Technology** that allows share, replicate and synchronize information from a **ledger** in a **distributed** way
- **Ledger** (data) is **managed** by the **network**. Not by a centralized entity.
- The **network** is composed by **nodes**



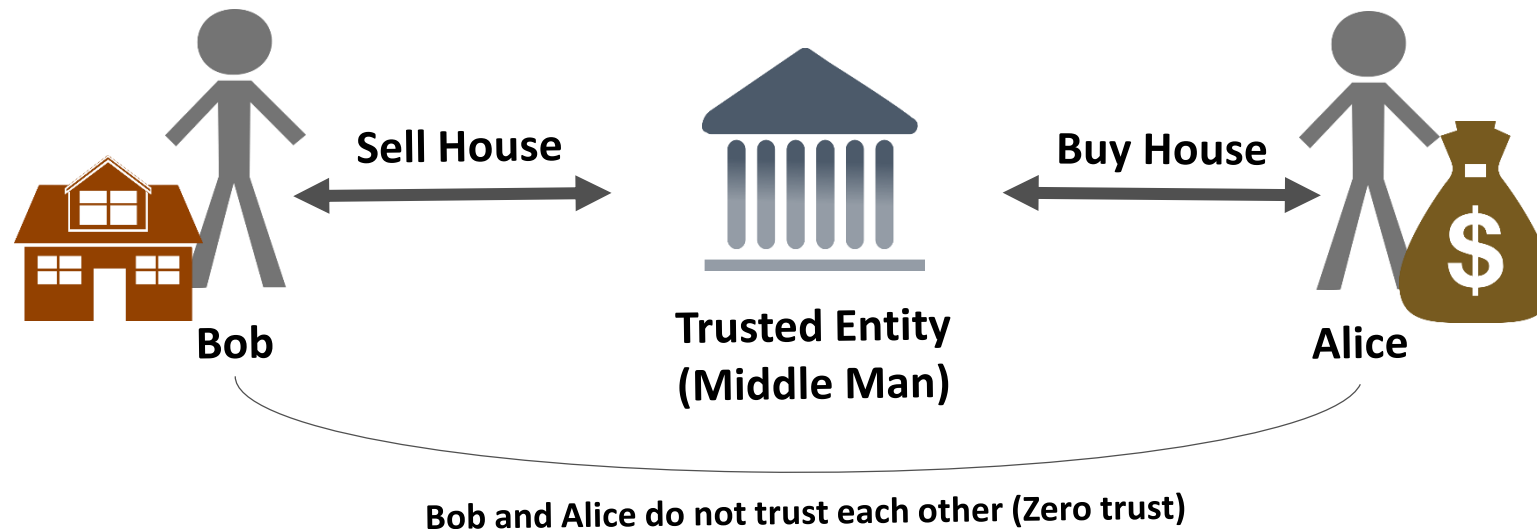
Blockchain

- **DLT** specific type of implementation
- The information is organized in a “**Sequence of Blocks**”.
- **Blocks’** content and its **order** is **decided** by the **network** in **consensus**

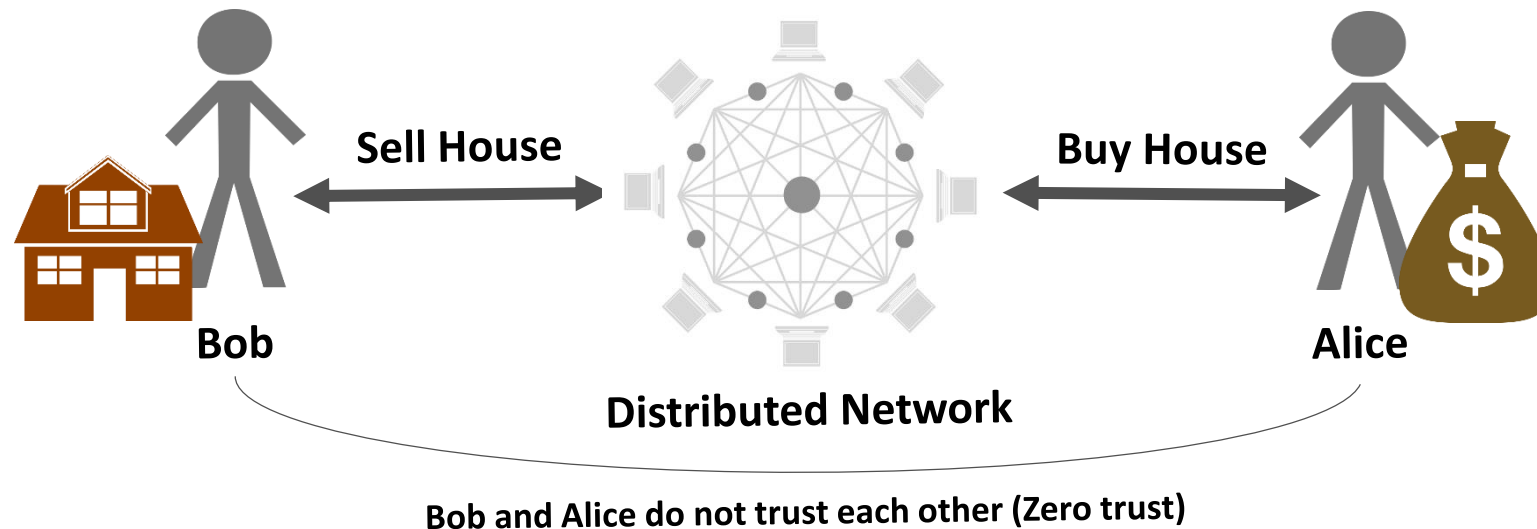




Blockchain technology is **Trustless** as it allows transactions *peer-to-peer* between entities, without them have to trust each other or in a agreed **centralized agent**.



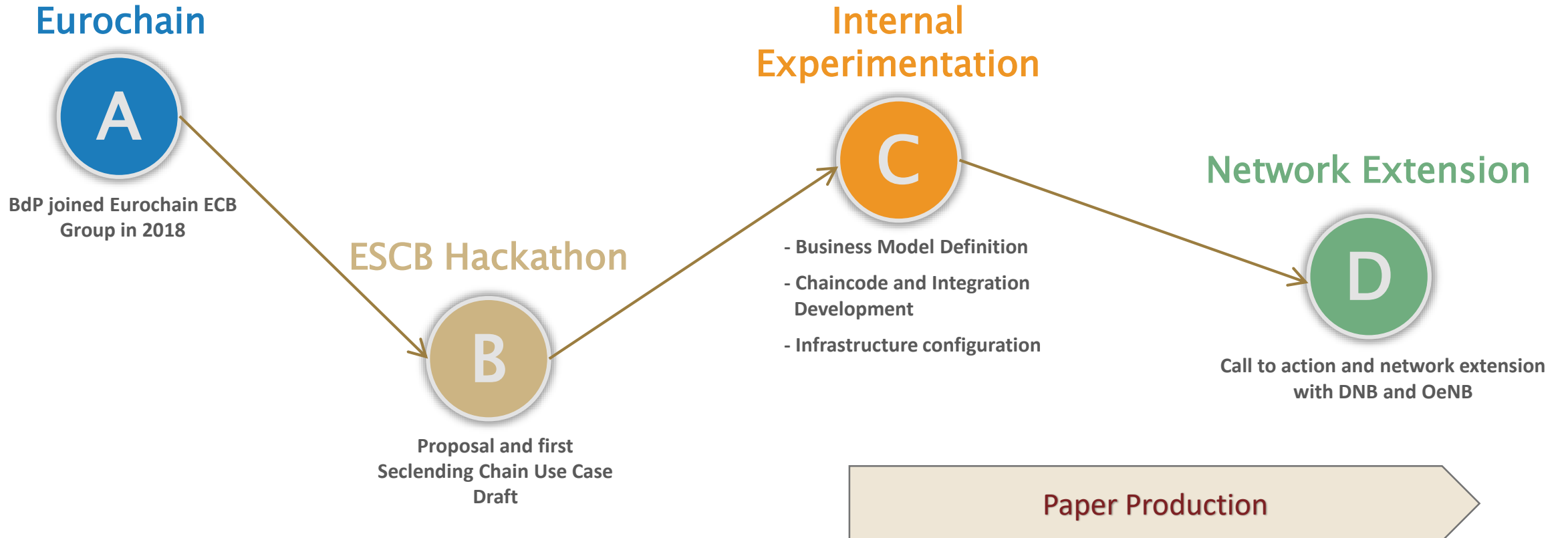
Blockchain technology is **Trustless** as it allows transactions *peer-to-peer* between entities, without them have to trust each other or in a agreed **centralized agent**.



Where is the Trust ?

- **Trust does not disappear!**
- It was simply **shifted** from a centralized to a decentralized model who “**grants trust**” to each party based on **mathematical guarantees** such as consensus, smart contracts, etc.
- By **removing** each and every physical middleman, completely **new business models** may emerge!
- NCBs, as regulators, must be able to **keep up** with the **technology** behind those new business models as there is a risk for not being able to understand the impact of the changes and **update** the **regulation** accordingly.

The road to Sec lending Chain



WHY

- Better **understand** the risks, **capabilities** and **implications** of this novel technology
- **Explore how** could this **technology** be **used** from a **NCB** point of view
- **Explore** why and how is this **technology helping** the **disruption** of current **business models**

WHAT

- **Identify** one, **low risk-based business function** that could benefit from **adopting blockchain** technology and promote it as a **candidate use case**
- **Collaborative work** with business, ESCB and external providers

HOW

- **Build a DLT experimentation** leveraging on an ESCB use case
- **Explore** the **development** and deployment of **smart contracts** for the chosen use case
- **Extend** the **experimentation** network with **NCBs**



Experimentation



Use Case



Securities Lending

Business Design



Business Design

Development



Chaincode (SmartContract)
Development

Integration



Interfaces development

Infrastructure



Infrastructure configuration

Network Extension



Replication and extension of
the network between NCB

Use Case



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What is it?

“**Securities lending** involves the owner of shares or bonds transferring them temporarily to a borrower. In return, the borrower transfers other shares, bonds or cash to the lender as collateral and pays a borrowing fee.”*

Why is it important?

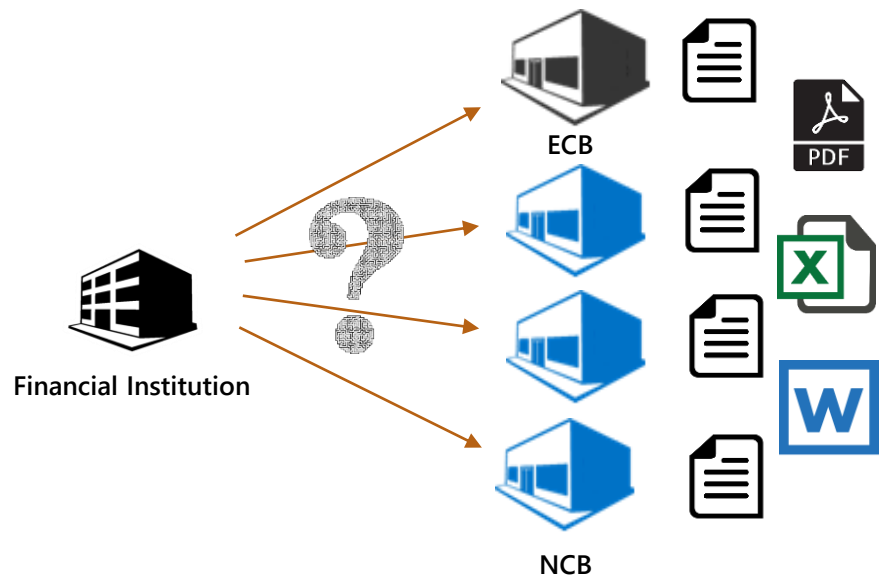
“The aim of our securities lending is to help the financial markets keep functioning smoothly. This is particularly important during our expanded Asset Purchase Programme (APP)”*

*Quotes from ECB

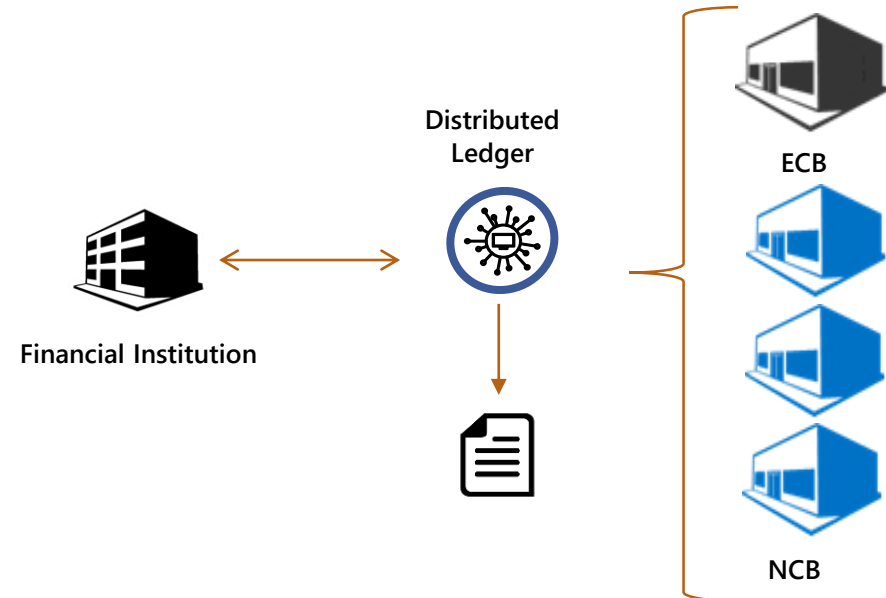


Process A: Looking for a Security

As-Is

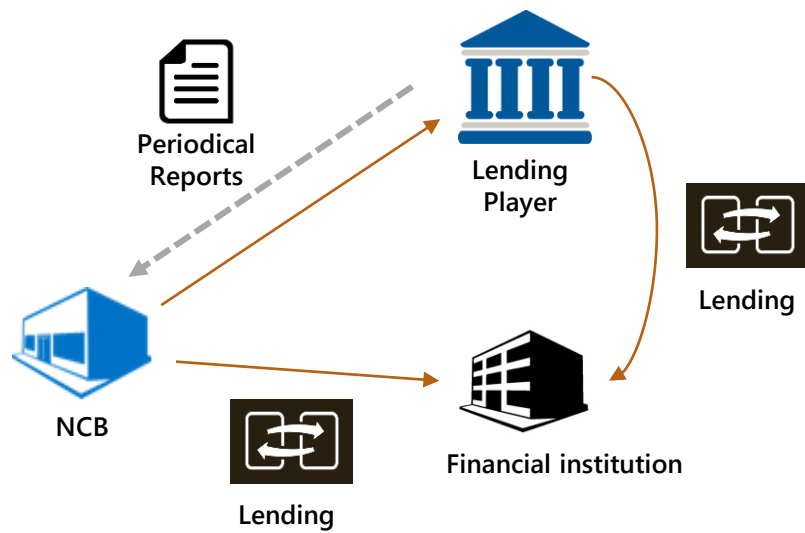


To-Be: SecLending Chain

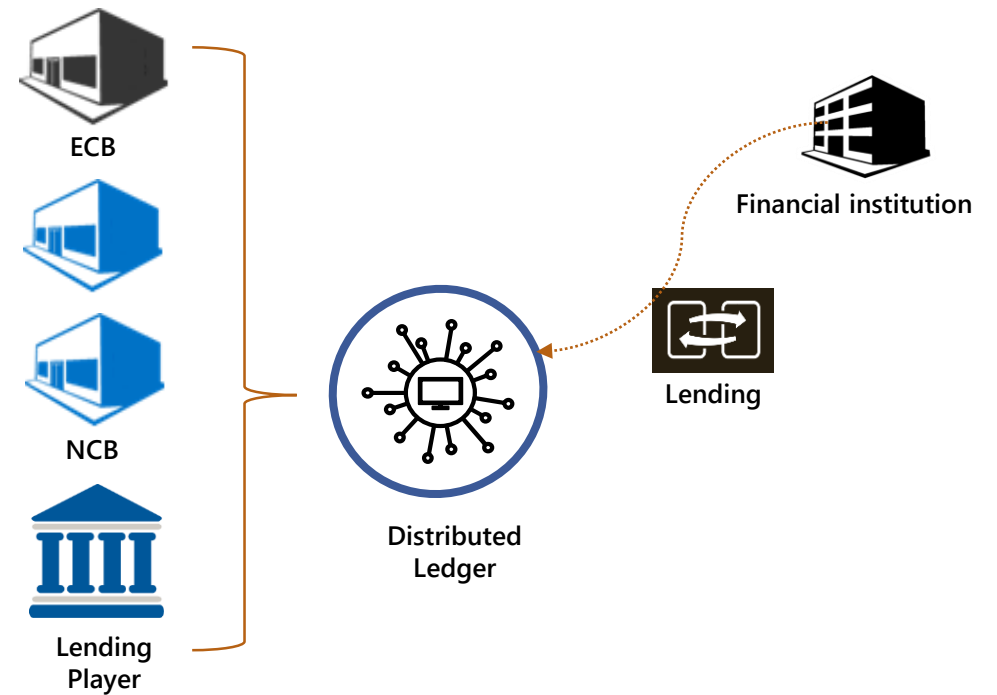


Process B: Lending a Security

As-Is



To-Be: SecLending Chain



Main Points

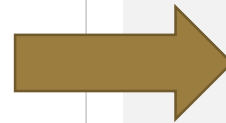


Status Quo

- Each Financial Institution has to search on multiple list to find a given Security
- Each NCB and the ECB decide which information is included on its own list and its format
- Lists are updated on a weekly basis
- The lending transaction may be processed by a third party – Lending Party

What is intended

- A single list with all the Securities available for lending
- List updated in real-time
- Lending operations being also registered on the ledger
- Increase the efficiency of the operations



- Reduce costs
- Improve User Experience for the end user
- Increase security, transparency and efficiency

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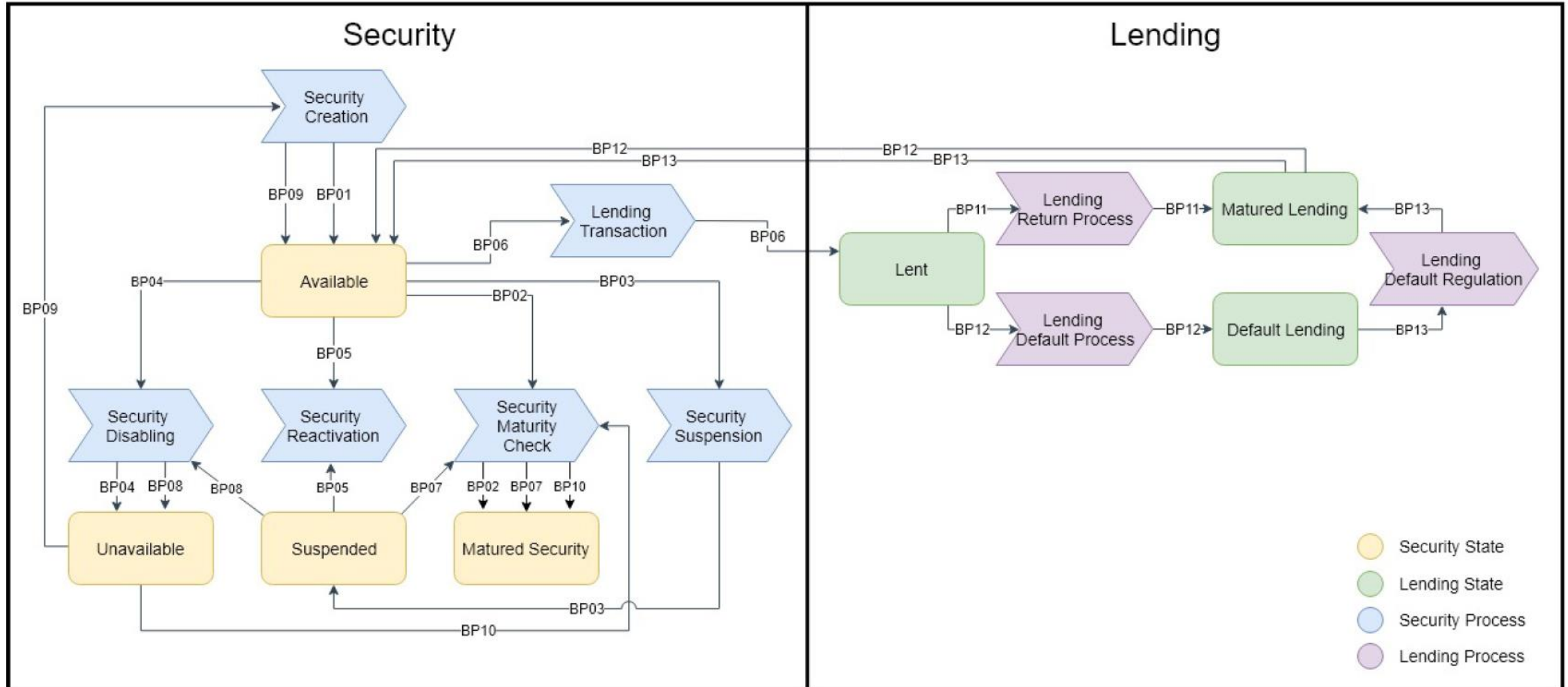


Infrastructure configuration

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```

SecLending
? (bdp) Choose an option (Use arrow keys)
□ List securities
  Create security
  Reenforce security
  Withdraw security
  Suspend security
  Unsuspend security
  Make security Unavailable
  Process expired security
  List lendings
  Lend Security
  Process ended lendings
  Quit
    
```

SecLendingOP Show/Hide | List Operations | Expand Operations

POST	/SecLendingOPs/createSecurity	Creates a new security
POST	/SecLendingOPs/enroll	Enrolls the user with Fabric CA to obtain certificate
POST	/SecLendingOPs/lendSecurity	Creates a new security
GET	/SecLendingOPs/listEndedLendings	List ended lendings
GET	/SecLendingOPs/listExpiredSecurities	List expired securities
GET	/SecLendingOPs/listLendings	List lendings
GET	/SecLendingOPs/listSecurities	List securities
POST	/SecLendingOPs/makeSecurityUnavailable	Makes security unavailable
POST	/SecLendingOPs/processEndedLending	Process ended lending
POST	/SecLendingOPs/processExpiredSecurity	Process expired security
POST	/SecLendingOPs/reenforceSecurity	Reenforce security
POST	/SecLendingOPs/suspendSecurity	Suspend security
POST	/SecLendingOPs/unsuspendSecurity	Unsuspend security
POST	/SecLendingOPs/withdrawSecurity	Withdraw security

SECLENDING André A. Leal

List Securities And Lendings **New Security** Login API User Enroll CA User Create User API

Listing

Securities

Search Securities

Isin	Status	Owner	Total Amount	Interest Rate	Lender Player	Maturity Date
PT0002	Expired	BdP	200	0.200%	Agent_L1	2019/01/28 18:14:27
PT0003	Expired	bdp	300	0.800%	l1	2019/01/28 18:18:00
PT0005	Available	bce	380	1.200%	l1	2020/01/01 00:00:00
PT0007	Available	bdp	300	1.000%	l1	2020/01/29 14:25:00

4 records

Lendings

Search Lendings

Isin	Status	Owner	Borrower	Amount	Fee	Colateral	Lender Player	Settlement Date	Maturity Date
PT0003	Lent	bdp	CGD	50	0.100%	Cash l1		2019/01/28 18:17:00	1900/01/01 00:00:00
PT0005	Lent	bdp	BCP	100	0.200%	Cash l1		2019/02/12 18:11:00	1900/01/01 00:00:00

2 records

Built with OutSystems

Interfaces development

- CLI
- API REST (Swagger)
- Front end (low code)



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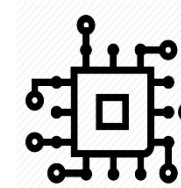
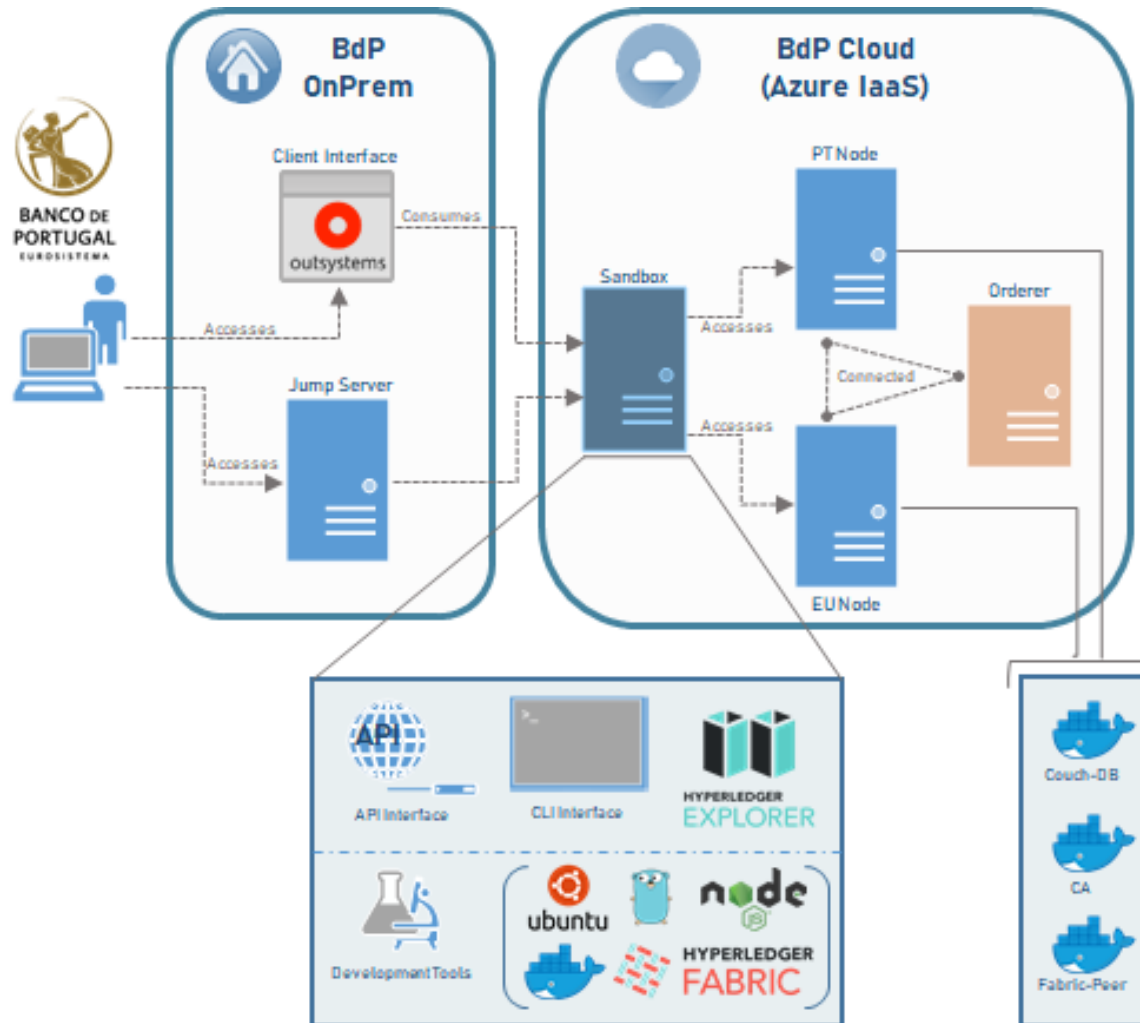
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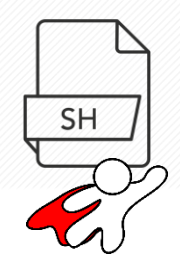
Experimentation: BdP DLT Infrastructure



Ubuntu 18.04 LTS

Hyperledger Fabric 1.3

- Install Environment
- Start Network
- Deploy Chaincode
-



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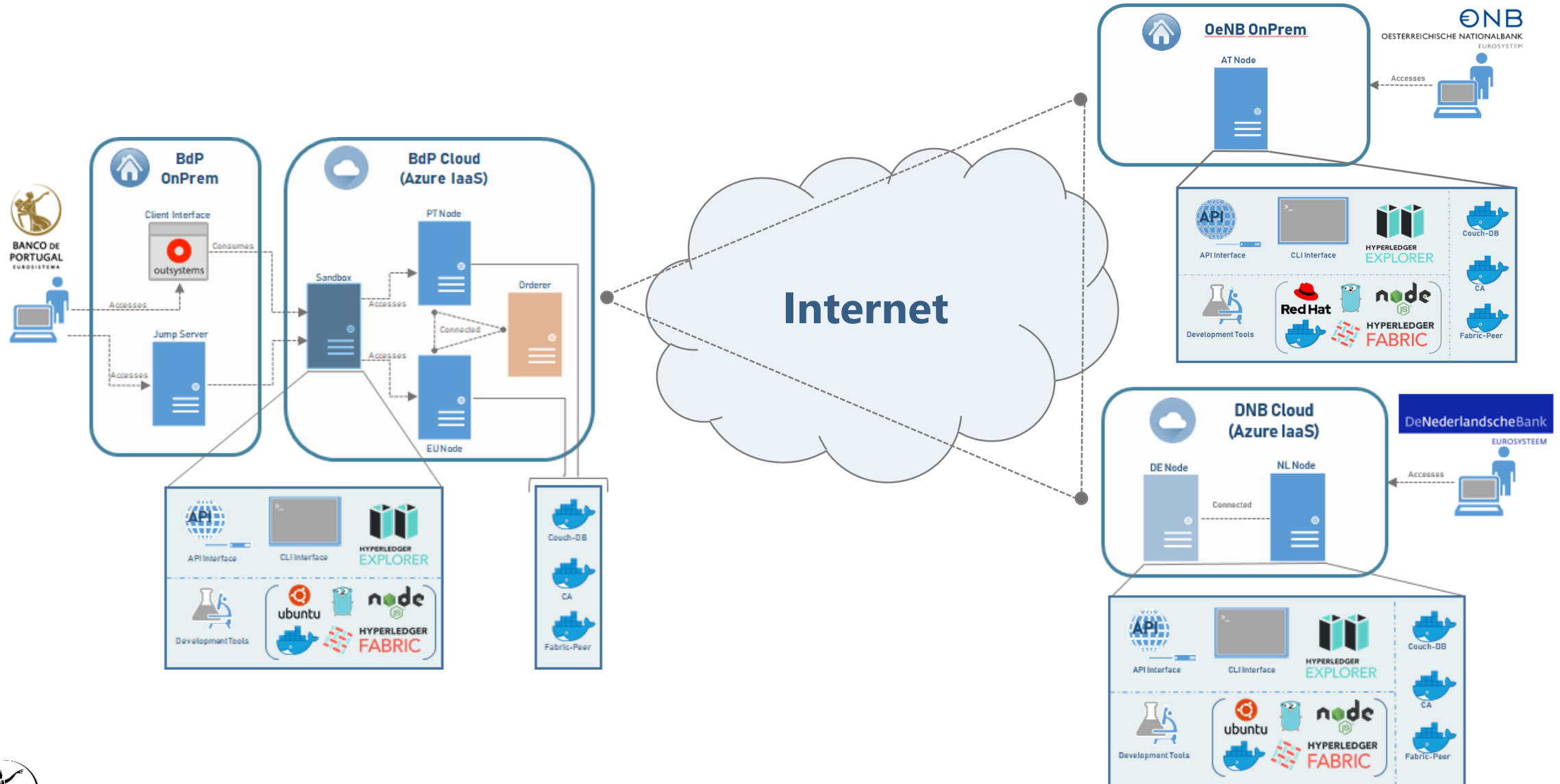
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Experimentation: ESCB Network Extension





Achievements



WHY

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- **Explore how** could this **technology** be **used** from a **NCB** point of view
- **Explore** why and how is this **technology** helping the **disruption** of current **business models**

Achievements

- **Identification of blockchain intrinsic capabilities:**
 - Trustless
 - Distributed
 - Tamper-proof
 -
- **And also its specific risks and limitations:**
 - Performance
 - Complexity
 - GDPR compliance
 - 51% attack
 -

WHY

- Better **understand** the **risks**, **capabilities** and **implications** of this **novel technology**
- Explore how could this **technology** be **used** from a **NCB** point of view
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Achievements

- **Improvement of BdP's knowledge** on distributed technology (**DLT**) with a **Real Use Case** scenario for Operational Efficiency leveraging on a **private model** (trustless++)
- **Identification of candidates use cases** for the identified intrinsic characteristics:
 - PSD2 / Digital Identity
 - CBDC
 - ...
- The importance of having a **Blockchain Framework** for **use case decision** (One Size does **NOT** Fit all)

WHY

- Better understand the risks, capabilities and implications of this novel technology
- Explore how could this technology be used from a NCB point of view
- Explore why and how is this technology helping the disruption of current business models

Achievements

- Transferring the control and ownership of the information to the user by removing it from the middle man organizations.
 - Peer to Peer Transactions,
 - End user controls the information lifecycle

Thank You

André Leal (Banco de Portugal)
aaleal@bportugal.pt

