

TokenD principles

A framework for enterprise tokenization platforms

Distributed Lab

What is TokenD?

A framework for creating tokenization platforms

TokenD consists of best practices, protocols, a codebase, wireframes, technical specifications, security, and quality standards

Why is TokenD Needed?

Having standardized best practices:

- Reduces time to market
- Increases security
- Reduces integration and deployment risks
- Makes TCO predictable

TokenD Assumptions

The TokenD framework enables the tokenization of real assets which are controlled by some organization (the platform owner).

Primary TokenD Use Cases

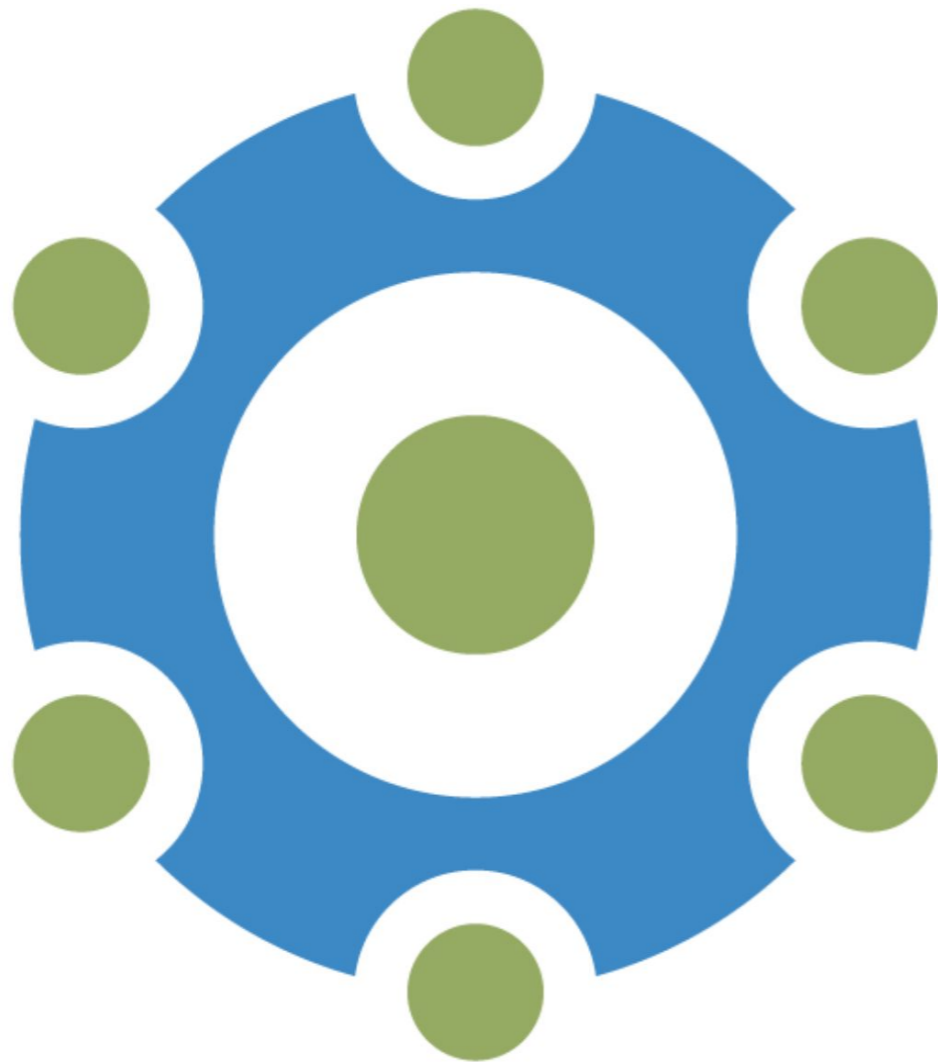
The TokenD tokenization platform enables:

1. Businesses to issue tokens
2. The registration and management of customers
3. The sale of tokens to customers for fiat/crypto
4. P2P and merchant transactions
5. The implementation of business logic for tokens (fees, limits, escrow, etc.)
6. The trading of tokens

Full Control with TokenD

1. The platform owner defines the principles of governance, KYC requirements, privacy standards, processing speed, and security - all based upon its specific business requirements.
2. The platform owner establishes platform roles, and the requirements for the assignment of such roles. Typical roles are “validators”, “auditors”, “users”, etc.
3. The platform owner determines whether transaction data is accessible to everybody or restricted to a defined and limited set of participants

Flexibility with TokenD



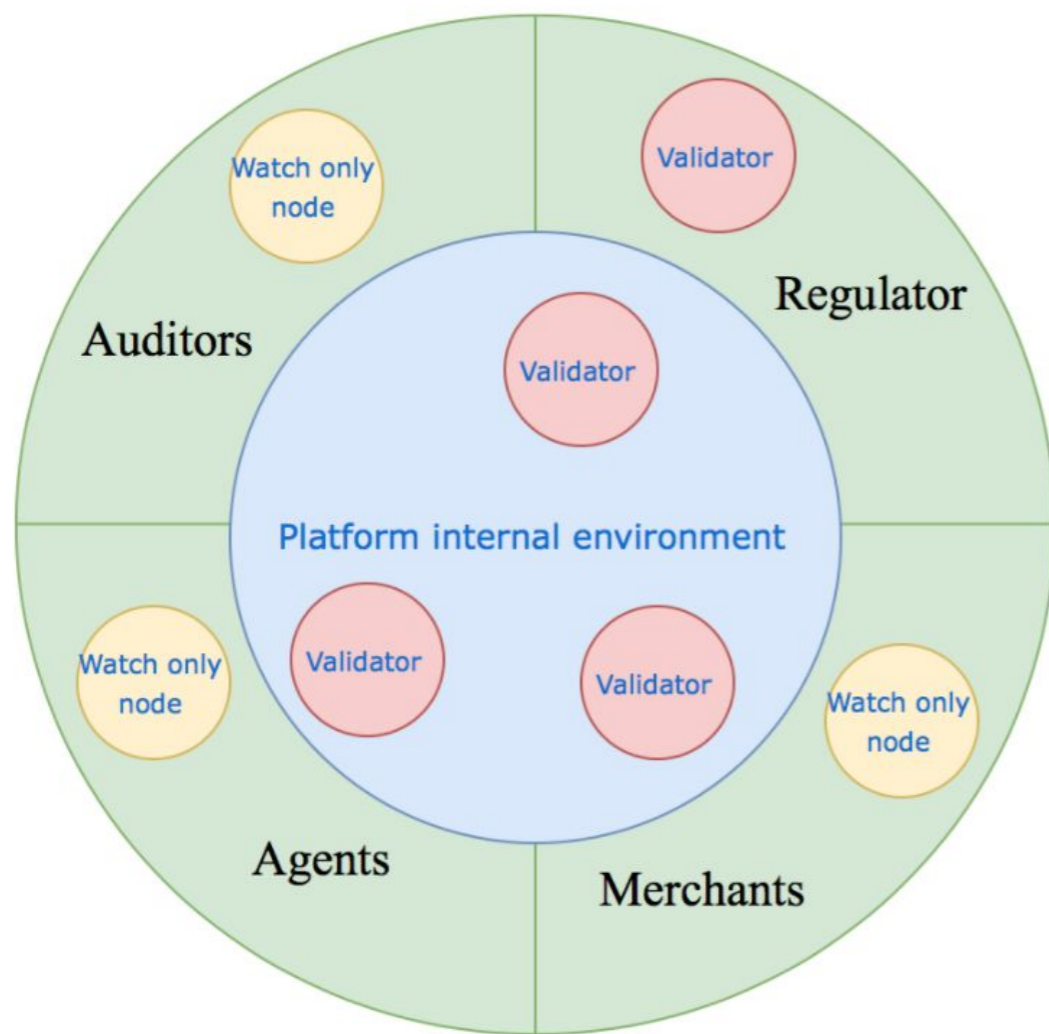
The TokenD platform seamlessly and continuously decentralizes storage, maintains auditability, and facilitates transaction processing, all at the required levels of granularity.

Powered by Blockchain

Blockchain technology enables:

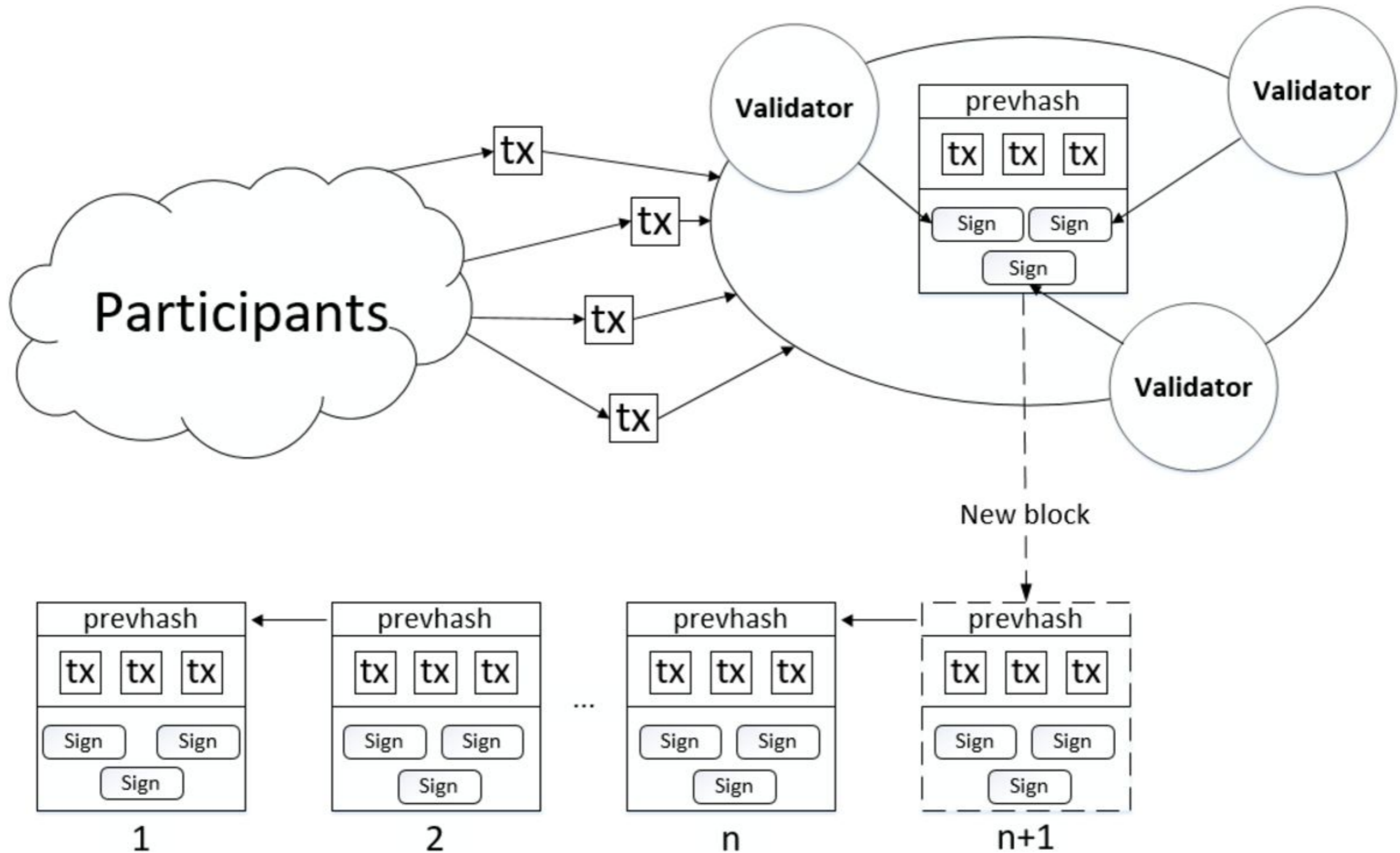
1. The creation of rules which are obeyed in a decentralized way
2. Decentralized transaction processing and history maintenance
3. Transparent and auditable decision-making for all involved entities
4. Selection of private or public blockchain mode

Transaction Validation



1. Platform owner decides how and where to distribute nodes
2. Each node has complete copy of all transactions
3. "Watch only" nodes access transaction histories, but do not validate them
4. "Validator" nodes reach consensus regarding new transactions, but do not modify prior transaction history

Transaction Validation



TokenD Functional Modules

The TokenD platform consists of four logical layers:

1. Core (blockchain)
2. Business logic
3. Customer / admin / agent / merchant / auxiliary apps
4. External integrations infrastructure

Each layer is separated from the other and communicates via API.

This API allows third party application connections, secure communications with the core, and the modification of user/merchant applications without alteration of the business logic.

TokenD Logical Modules

- Depository
- Exchange
- Payment system
- Wallets

Seamlessly integrated ledger, exchange and payment systems

TokenD User Roles

- User
- Issuer (Business)
- Administrator
 - Master Administrator
 - Issuance Administrator
 - Security Administrator
 - KYC & Compliance Administrator
 - AML & Limits Administrator
 - Fee Administrator
- Agent (distribution or redemption of tokens)
- Merchant

Token Issuance

1. The platform can contain the Native Token
2. Issuance of tokens of the businesses is done by them, but could be approved by the platform owner
3. 1:1 ratio is guaranteed by the issuer

Token Architecture

Token is an account that contains balance of specific asset.

Internal token can represent:

1. Integral value of all assets issued on the platform (index)
2. Share of the platform itself
3. Utility token that is needed to pay fees, services etc

Tokens of companies/issuers

1. Each company issues its own token which is approved by the platform admin
2. Tokens are backed by real assets
3. Proof of reserves could be provided via signed receipts from the issuer

Consensus

Consensus is reached between participants that are selected by the platform operator:

1. Platform operator itself
2. Auditors
3. Regulators
4. Businesses that issued tokens on the Platform

Every node is able to control what other nodes are doing, even if this node is watch-only.

Amount of validators can be changed on the fly.

Environment requirements

Core of the system can be securely installed on enterprise server, in the cloud or in some other public/private infrastructure. Transition between all kinds of servers is done smoothly. This ability is achieved by means of using the blockchain technology.

Security

- Account balance can be changed only with a cryptographic key
- Any transaction is timestamped and irrevocable. One cannot cancel or modify the transaction that was confirmed in the past
- Each transaction is an atomic operation: it can not be applied partially
- Each important action is protected via multisignature
- System doesn't have a single point of failure because infrastructure is distributed

Key management

- Keys can be stored at mobile devices, key server, hardware device or as a paraphrase
- Separation of responsibility is implemented via multisignature

KYC & AML

- Only platform owner or regulator is able to get access to identities of the customers
- KYC is done by platform itself or by third parties
- KYC info is encrypted and stored in a separate database
- Each transaction could trigger external AML engine

Trust

Users voluntarily become customers of the platform and hold tokens in wallets.

Platform requires two types of trust from users:

1. Trust to a token issuer (proof of 1:1 ratio for collateral)
2. Trust to a transaction processing system (protection from double spending attacks)

Trust of the second type is guaranteed by means of cryptography

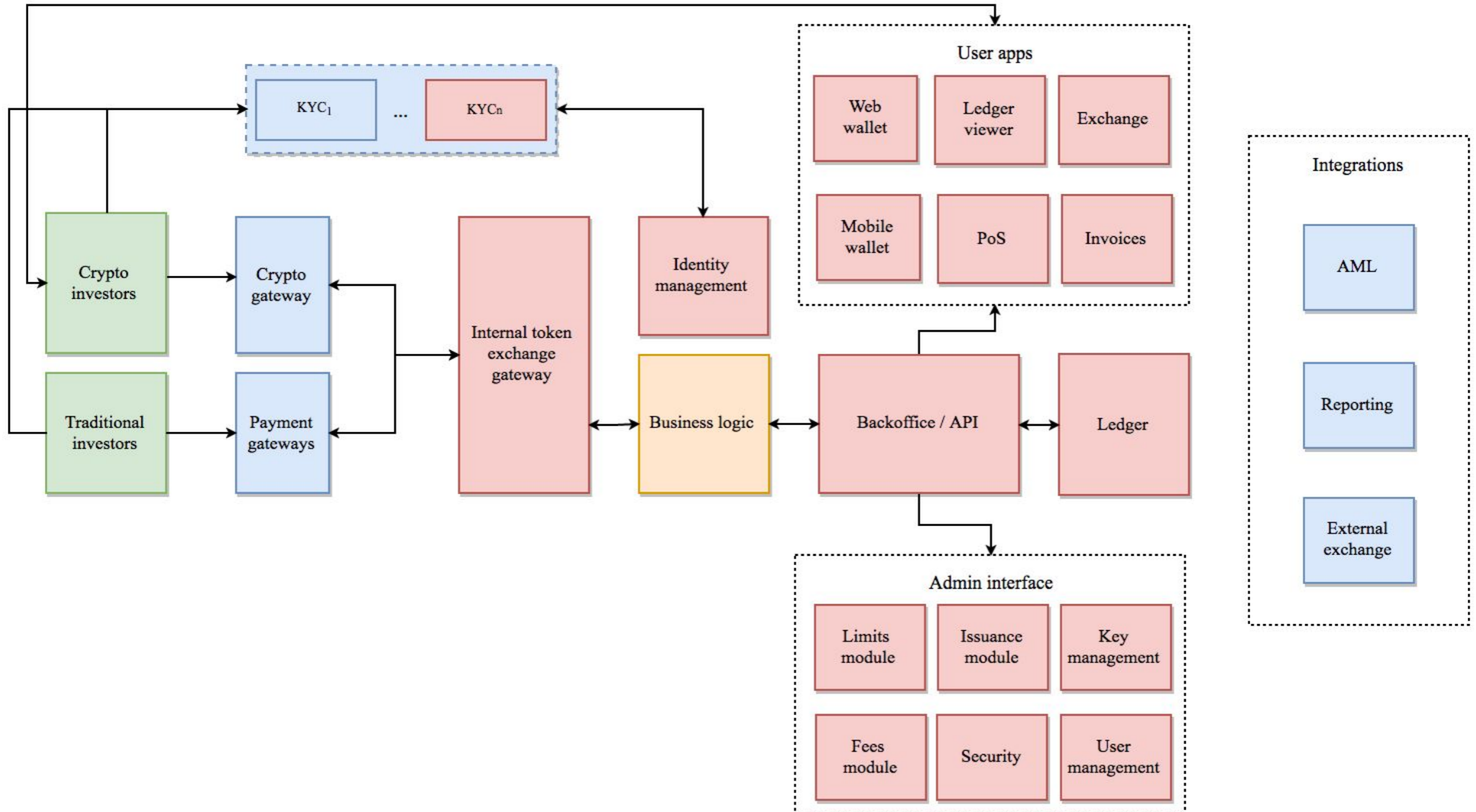
Transparency

- Each customer of the system has full history of their own transactions
- Each transaction results to a cryptographically signed confirmation
- All actions, including fee changes are transactions. Full history of the changes of all the balances can be provided to auditors
- Nobody, including platform operator, can't change the state of account of the user secretly

Privacy

- Transaction is processed by parties that are concerned about it
- Transaction metadata is available only to entities that are authorized to access it

Integrations



TokenD is a Wordpress for
asset management

Difference from centralized systems

1. Every token holder can prove that their balance represents the result of correct execution of a set of transactions (**audibility**)
2. No one can change the balance of account without being noticed (**integrity**)
3. It is hard to delete the state of the ledger (**robustness**)
4. It is easy to prove who initiated which actions (**non-repudiation**)

TokenD Functional Modules

1. Issuance module
2. KYC and identity module
3. Limits management module
4. Fees management module
5. Ledger viewer
6. Mobile & web wallet
7. Security monitoring
8. Exchange
9. PoS and e-commerce module

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