BankEx Yellow Paper

Version 0.1 alpha

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Abstract

BankEx Proof-of-Asset protocol are being described.

1 Introduction

1.1 BankEx Liquidity Protocol

1.2 Game theory behind Proof-of-Asset protocol

2 Modern Financial Markets

2.1 Classical Microservice Architecture

Microservice architecture is an approach to structuring applications whereby they are broken down into smaller independent internal components.

Advantages of microservice architecture:

- autonomous ownership for different microservices within an application;
- agility, application micro-components can be developed and tested in autonomous decentralized teams much faster;
- improved scalability (scaling independent of other components, on-demand scaling);
- continuous delivery and deployment of micro-components.

2.2 Bank-as-a-Service (BaaS) Business Model

2.3 BaaS Decentralized Model

2.4 Blockchain Service Architecture (BlockSA)

2.5 Blockchain Service Architecture (BlockSA) Difficulty Tuning

2.6 What is Blockchain Service Architecture (BlockSA)

2.7 Liquidity Theory Through the Prizm of Tokenization

2.8 Market Making Mathematical Models for Smart Asset

We use the following notation in our formulas:

- Trading volume disccount: $D_{TradingVolume}$

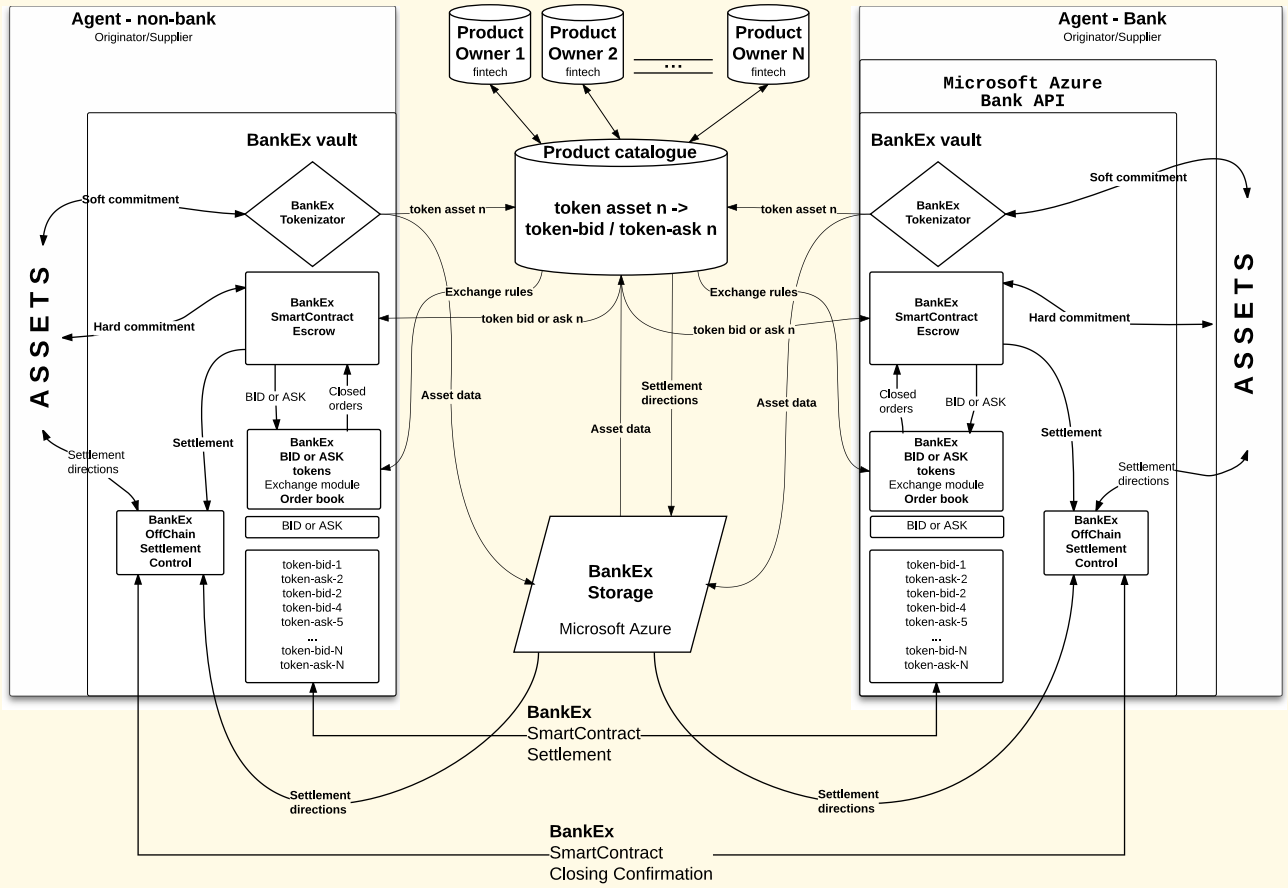

Figure 1: Bankex Platform

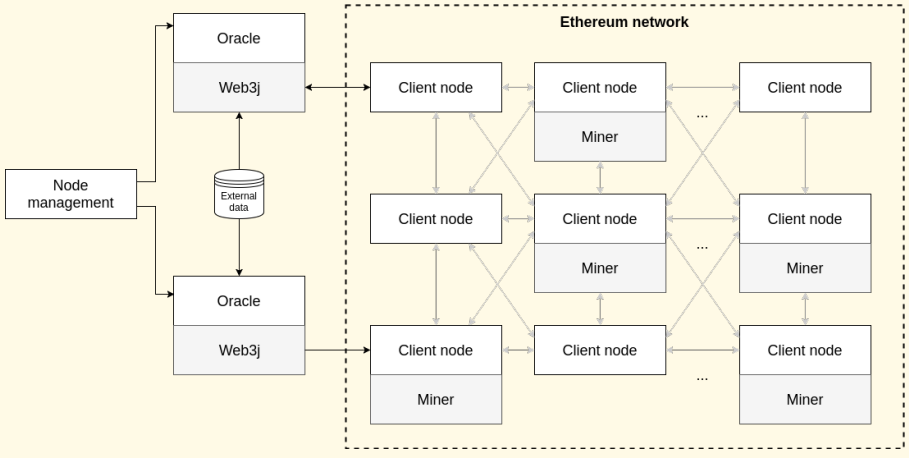

Figure 2: Blockchain Service Architecture

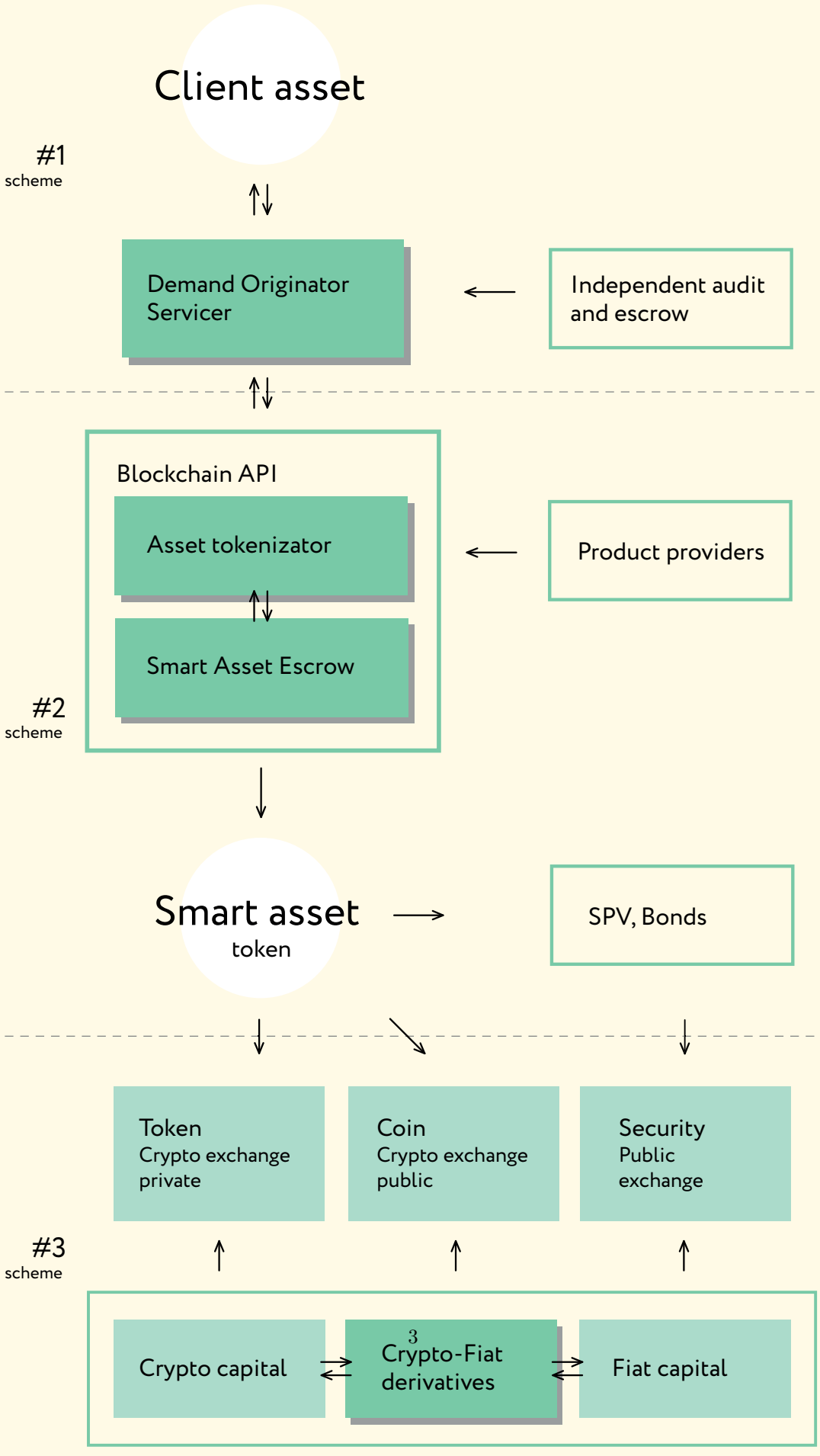
Client asset
#1
scheme
Demand Originator
Servicer
Independent audit
and escrow
Blockchain API
Asset tokenizator
Smart Asset Escrow
Product providers
#2
scheme
Smart asset
token
SPV, Bonds
Token
Crypto exchange
private
Coin
Crypto exchange
public
Security
Public
exchange
#3
scheme
Crypto capital
3
Crypto-Fiat
derivatives
Fiat capital

Table 1: Key players

30-Day Liquidity-Making Buy/Sell Ratio	**Maker Discount (bps)**
Worse than 35/65 (or 65/35)	0
35/65 (or 65/35) or better	0
40/60 (or 60/40) or better	10
45/55 (or 55/45) or better	15

Table 2: Roles

Player	**Role**
Traders	Make buy/sell orders
Market makers (speciaists)	Display public buy & sell quotations for a guaranteed number of security/good to traders and fulfill orders from traders at these quotations
Dealers	Buy and sell security/good from traders but do not disclose quotes publicly
Brokers	Execute orders on behalf of its clients

- Buy/Sell Ratio Discount: $D_{\frac{Buy}{Sell}}$
- Total Maker trading volume V_{Maker}
- Total Taker trading volume V_{Taker}

Maker:

$$f_{Maker} = \left(25 - D_{TradingVolume} - D_{\frac{Buy}{Sell}}\right) \times V_{Maker} \tag{1}$$

Taker:

$$f_{Taker} = \left(25 - D_{TradingVolume}\right) \times V_{Taker}, \tag{2}$$

$$\text{where } D_{TradingVolume} = \begin{cases} 0 & \text{if } V_{Taker} < 10\ 000\ BKX \\ 10 & \text{if } V_{Taker} \geq 10\ 000\ BKX \end{cases}$$

$$f_{Total} = f_{Maker} - f_{Taker} \tag{3}$$

A Terminology

Blockchain — is a continuously growing list of records, called *blocks*, which are linked and secured using cryptography [1] [2].

Tokenization — process of converting rights into digital token to be circulated onver blockchain with low transactional fees. Tokenization is a blockchain equivalent of securitization.

References

[1] Arvind Narayanan et al. *Bitcoin and cryptocurrency technologies: a comprehensive introduction*. Princeton: Princeton University Press, 2016. ISBN: 9780691171692.

[2] Wikipedia. *Blockchain*. 2017. URL: `https://en.wikipedia.org/wiki/Blockchain`.