



# KOFO

开放的数字资产交换网络

Open digital asset exchange network

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## 摘要

## Abstract

KOFO 是一个开放的数字资产交换网络。KOFO 以多链互换技术为基础，以开放式流动性共享为核心特征，以区块链技术赋能数字金融。KOFO 网络通过 Settlement Protocol, Clearance Protocol 和 P2P Exchange Protocol 三层架构设计分别实现结算、清算和金融资产流动性共享功能，三层协议既相互联系又各自独立，并都具有开放性的特点。KOFO Settlement Protocol 基于 Hash Lock 原理设计，已在全球范围首次实现 BTC 和 ETH 的原子互换，并将实现对更多传统金融资产互换的支持。KOFO 将作为数字金融生态“最轻量级”和“最完整流程”的资产交换基础设施在完善区块链生态以及打通数字金融和传统金融市场方面发挥重要作用。

**KOFO is an open digital asset exchange network.** KOFO is based on the multi-chain swap technology and with open liquidity sharing as the core feature, which enables digital finance with the Blockchain technology. The KOFO network realizes the functions of settlement, clearance and financial asset liquidity sharing through the three-layer architecture design of Settlement Protocol, Clearance Protocol and P2P Exchange Protocol. The three layers of protocols are not only interrelated but also independent, and all of them are characterized by openness. KOFO Settlement Protocol is designed based on the Hash Lock principle, which has realized atomic swap of BTC and ETH for the first time in the world, and will support swap of more traditional financial assets. As the “bantamweight” and “most complete process” asset exchange infrastructure of the digital financial ecosystem, KOFO will play an important role in improving the Blockchain ecology and opening up the digital finance in the traditional financial market.

## 一、项目背景

### I. Project background

科技对于金融业务模式演变发挥重要影响如数据处理技术的发展推动上个世纪信用卡的诞生。自 2009 年比特币诞生以来，尽管区块链将对金融业务产生重要影响的观点获得普遍认同，但截至目前，即使在基础的金融资产交易领域，区块链发挥的作用仍然非常有限。目前，主要由中心化交易所承担数字资产交换的功能，但安全风险和操作风险高，虽然具有一定的流动性但交易成本高；去中心化交易仅限于支持 ERC20Token 及其他少数几种 Token，流动性不足导致交易效率明显偏低。中心化交易所和去中心化交易所大量重复投入却无法在个体商业利益和交易资源共享之间形成平衡。上述问题一方面需要在技术层面有所突破如跨链互换技术，另一方面也为金融行业描绘出一个生态更趋丰富、机制更趋灵活、兼顾个体利益和行业效率的美好蓝图。

**Technology plays an important role in affecting the evolution of financial business models, such as the fact that the development of the data processing technology promoted the birth of credit card in the last century.** Since the birth of Bitcoin in 2009, although the view that Blockchain will have a significant impact on financial business has been widely recognized, so far, even in underlying financial asset transactions, the role of Blockchain has still been very limited. At present, the centralized exchange is mainly responsible for the function of digital asset exchange, but security and operational risks are high. Although it has certain liquidity, the transaction cost is high; Decentralized transaction is only limited to supporting ERC20Token and a few other types of Tokens, and liquidity deficiency results in significantly inefficient transactions. The centralized and decentralized exchanges have a large amount of repeated investment, but they are unable to balance the individual business interests and transaction resource sharing. On the one hand, the above problems need to make a breakthrough on the technical level, such as cross-chain swap technology, and on the other hand, it will also draw a beautiful blueprint for the financial industry to be more ecological with a more flexible mechanism, which takes into account individual interests and efficiency of the industry.

## 二、KOFO 网络

### II. KOFO network

#### 2.1 项目定位

#### 2.1 Project positioning

KOFO 是一个开放的数字资产交换网络。KOFO 网络包括 Settlement Protocol, Clearance Protocol 和 P2P Exchange

Protocol 三层架构。其中, KOFO Settlement Portocol 以多链交互技术为基础主要实现结算功能, 目前已经基于 Hash-Lock 原理实现 BTC 和 ETH 的原子互换, KOFO Settlement Protocol 通过对脚本语言的解析和智能合约的开发还可以实现对基于数字资产产生的大量的金融产品及金融衍生品之间的交易、互换、抵押和资产证券化等业务操作, 并可以通过通用架构的设计使得多链互换形成网络效应; KOFO Clearance Portocol 主要实现不同节点之间通信寻路、手续费分成等功能, 同时采用类似于 POI 机制对参与流动性共享的节点进行赋权, 并基于对节点的赋权进行共享路径推荐<sup>1</sup>; P2P Exchange Portocol 主要基于 P2P 通信实现

KOFO is an open digital asset exchange network. The KOFO network consists of the three-layer architecture: Settlement Protocol, Clearance Protocol and P2P Exchange Protocol. Among them, KOFO Settlement Protocol realizes the settlement function mainly based on the multi-chain interaction technology. At present, the atomic swap of BTC and ETH has been realized based on the Hash-Lock principle. KOFO Settlement Protocol can also realize the trading, swap, mortgage and asset securitization and other business operations among a large number of financial products and derivatives through the analysis of scripting languages and the development of smart contracts. Through the design of the general architecture, multi-chain swap forms the network effect; KOFO Clearance Protocol mainly realizes the functions of communication path finding and handling fee sharing between different nodes. At the same time, it uses the mechanism similar to POI to empower nodes involved in liquidity sharing, and recommends the shared path based on the empowerment of nodes; <sup>1</sup>P2P Exchange Protocol is mainly realized based on P2P communication

订单撮合、隐私信息保护等功能。KOFO 三层架构既相互独立又有机结合, 并都具有开放性的特点, 用户和节点可以基于 KOFO 系统的支持随时实现接入, 分别或者组合使用清结算及流动性共享服务。

Order matchmaking, privacy information protection and other functions. The three-layer architecture of KOFO is both independent and combined organically, and has the characteristic of openness. Users and nodes can be accessed at any time based on the support of KOFO system, which use the services of clearance, settlement and liquidity sharing separately or in combination.

Figure1: KOFO 3 Layers Architecture

## 2.2 主要特点

## 2.2 Main features

KOFO 基于坚实的技术基础以及分布式商业思维, 体现出安全、透明、兼容、开放的显著特点。KOFO Settlement Protocol 承担系统结算功能, 所有交易流程均在院子层面实现, 交易全程没有任何中间人参与, 且交易资产在互换成功之前均不发生控制权转移, 整个交易系统没有任何操作风险, 此外, KOFO Settlement Protocol 设计了撤回交易方式, 一旦交易双方设定的任何条件没有达到, 则交易资产原路退回即 KOFO 交易的结果只有交易双方同时实现互换或者各自持有自己资产, 而不会出现部分成交问题。KOFO Settlement Protocol 同时设计了状态监测模块, 对于结算整个流程进行监测, 记录所有中间业务状态, 整个系统设计充分体现了透明的原则。KOFO 集成了三层架构, 并通过提供 API 和 SDK 的方式和钱包、DEX、IM 以及各类 Dapp 链接, 汇聚碎片化和场景化的流量为用户流动性共享提供支持; 同时, KOFO 的三层架构设计定义了多链互换的基本技术框架, 任何一个公链生态只要和 KOFO 系统实现连接, 即可和所有已经接入 KOFO 网络的公链生态实现连接, 而无需再一一对接, KOFO 的设计保证其具有通用性。KOFO 的三层协议既相互结合又各自独立, 并都具有开放的特点, 其中, Clearance Protocol 可以接入任何具有生成订单簿功能的机构或个人, 但参与流动共享的分润形式和路径权重按照生态的统一规则进行; P2P Exchange Protocol 不仅可以接入 Token 类资产, 同时也可接入满足“条件支付”的大部分传统金融资产, KOFO 网络的通用性和开放性使其在流动性共享方面具有天然优势。

Based on a solid technical foundation and distributed business thinking, KOFO is significantly characterized by safety, transparency, compatibility and openness. KOFO Settlement Protocol undertakes the system settlement function, all transaction processes are implemented at the yard level, and no middleman is involved throughout the transaction. There is no transfer of control until the swap is successful, and there is no operational risk in the entire trading system. In addition, KOFO Settlement Protocol has designed a way to withdraw transactions. Once any condition set up by both parties to the transaction is not met, then trading assets are returned along the original way, that is, the result of KOFO trading is that only both parties swap at the same time or hold their own assets, and the problem that a deal is partially made will never occur. At the same time, KOFO Settlement Protocol has designed the status monitoring module to monitor the whole settlement process and record the status of all intermediate business. The design of the whole system fully reflects the principle of transparency. KOFO integrates the three-layer architecture, and provides API and SDK, wallets, DEX, IM and all kinds of Dapp links to support the sharing of user liquidity through the collection of fragmented and scenario data; At the same time, the three-layer architecture design of KOFO defines the basic technical framework of multi-chain swap. Any public chain ecology can be connected to all the public chain ecology that has been connected to KOFO network as long as it is connected to the KOFO system, and there is no need to connect one by one. The design of KOFO ensures its generality. The three-layer protocols of KOFO are not only integrated with each other, but also characterized by openness. Among them, Clearance Protocol can access any organization or individual with the function of generating order book. However, the form of profit sharing and path weight of flow sharing are carried out according to the unified rules of ecology; P2P Exchange Protocol can not only access Token assets, but also most traditional financial assets which satisfy “conditional payment”. The generality and openness of the KOFO network enable it to have natural advantages in liquidity sharing.

<sup>1</sup>POI 即重要性证明, 应用于 NEM Blockchain 的一种共识机制;

<sup>1</sup> POI, a proof of importance, is a consensus mechanism applied to NEM Blockchain;

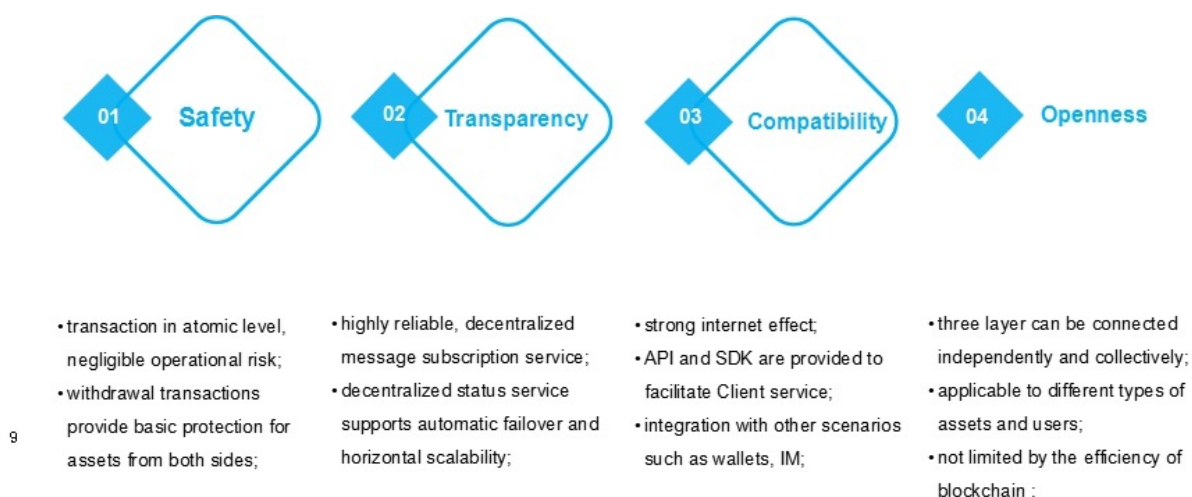


Figure 2: KOFO main features

## 2.3 业务说明

## 2.3 Business description

### 2.3.1 结算服务

#### 2.3.1 Settlement service

KOFO Settlement Protocol 提供结算服务，结算记录的生成主要包含两种方式：

KOFO Settlement Protocol provides the settlement service, and the generation of settlement records consists of two main ways:

- P2P 交易：即交易双方已经沟通好交易价格和数量之后可以直接通过 KOFO 交易，KOFO 发挥结算功能。P2P 交易无需支付任何手续费，KOFO Settlement Protocol 确保安全达成交换或资产原路退回，整个过程原子性保障，不会出现中间情况，确保交易双方的资产安全。
- P2P transaction: That is, both sides can directly trade through KOFO after communicating on the price and quantity of the transaction and KOFO brings the settlement function into play. P2P transactions do not need any handling fee, and KOFO Settlement Protocol ensures that swap is achieved safely or assets are returned along the original way. The entire process is guaranteed atomically without any intermediate situation to ensure the safety of assets of both parties to the transaction.
- Instant 交易：第三方机构接入 KOFO，通过提供流动性支持帮助用户实现交换。由于涉及到订单簿的有效性，KOFO 将要求第三方接入机构存入一定的保证金或进行相应的资产抵押以便维护其作为交易中介的头寸。
- Instant transaction: Third-party organizations access KOFO and help users realize exchange by providing liquidity support. As the validity of the order book is involved, KOFO will require the third party access organization to deposit a certain margin or carry out the corresponding asset mortgage in order to maintain its position as a transaction intermediary.

### 2.3.2 清算服务

#### 2.3.2 Clearance service

通过撮合生成的结算订单、撮合交易形成的交换路径、交换所引起的服务费用、双方交换订单簿的变化等都需要通过清算服务保证其正确性和无法篡改、同时，需要多方一起对其产生的账务变化进行见证。清算的目标就是完成这些账务变化，保证其正确性和公开性，为结算流程做充分的准备。

The correctness of Settlement orders generated by matchmaking, exchange paths formed by deal matchmaking, service fees caused by exchange, changes in the exchange of order book between the two parties, etc. needs to be ensured through the clearance service, and it cannot be tampered with. At the same time, multiple parties are required to witness changes in accounting arising from it. The objective of clearance is to complete these accounting changes in order to ensure their correctness and openness and to make full

preparations for the settlement process.

KOFO 提供如下类型清算服务:

KOFO provides the following types of clearance services:

- 交换发起单、撮合匹配单、交换路径清算服务
- Exchange initiating sheet, matchmaking sheet and exchange path clearance service
- 交换手续费清算服务
- Clearance service for exchange handling fee
- 隐私保护服务
- Privacy protection service

清算服务需保证交换服务的结果无法篡改, 按照交换的要求计算手续费并通过共识的方式让所有清算参与方和见证方保证其所有账务改变的一致性; 通过隐私保护技术, 对交换路径中既需要多方见证但同时又不能泄露关键数据的信息进行清算。

Clearance service is required to ensure that the results of the exchange service are not tampered with, and the handling fee shall be calculated according to the requirements of the exchange, so that all clearance participants and witnesses are able to ensure consistency in all changes in their accounts through consensus; Privacy protection technology is used to liquidate information in the exchange path that requires multiple witnesses but no leakage of key data at the same time.

### 2.3.3 资产交换服务

### 2.3.3 Asset exchange service

通过开放的 KOFO Exchange protocol 接入到 KOFO 的任何交易, 只要遵循协议的规定, 都可以在 KOFO 基于 P2P 所构建的交换网络中完成交易, 无论这种交易指向的资产是否基于区块链技术, 传统的银行或各类金融机构都可以在这个网络中发布自己希望交易的资产。KOFO 将打通传统的金融网络和基于区块链的数字资产的金融网络。

Any transaction that is accessed to KOFO via an open KOFO Exchange protocol, as long as the protocol is followed, can be completed in the P2P-based switching network of KOFO, whether this kind of transaction directed assets is based on the Blockchain technology or not, traditional banks or various financial institutions can release assets they wish to trade in the network. KOFO will open up the traditional financial network and digital asset financial network based on Blockchain.

KOFO 的交换层服务主要有以下特点:

The exchange layer service of KOFO has the following characteristics:

- 开放的 Exchange 的协议, 几乎所有的资产均可以在其网络发布和交换
- Open Exchange protocol, almost all assets can be released and exchanged on its network
- 通过 claim-fulfil 去中心化的撮合机制, 确保所有的交换参与方获得应有的利益
- Ensure that all exchange participants receive the benefits they deserve through the decentralized matchmaking mechanism of claim-fulfill
- 中间商的关键敏感信息得以隐匿
- Key sensitive information of middlemen can be hidden

## 三、技术架构

## III. Technical architecture

### 3.1 功能模块

### 3.1 Function module

KOFO 的技术架构服务于其业务目标。在 KOFO 的业务架构中, 每一层都需要专业的技术解决方案, 达成各层的



业务目标。KOFO 的三层架构及其技术要点如图所示：

KOFO's technical architecture serves its business objectives. In the business architecture of KOFO, each layer requires professional technical solutions to achieve the business objectives of each layer. The three-layer architecture of KOFO and its technical essentials are shown in the figure:

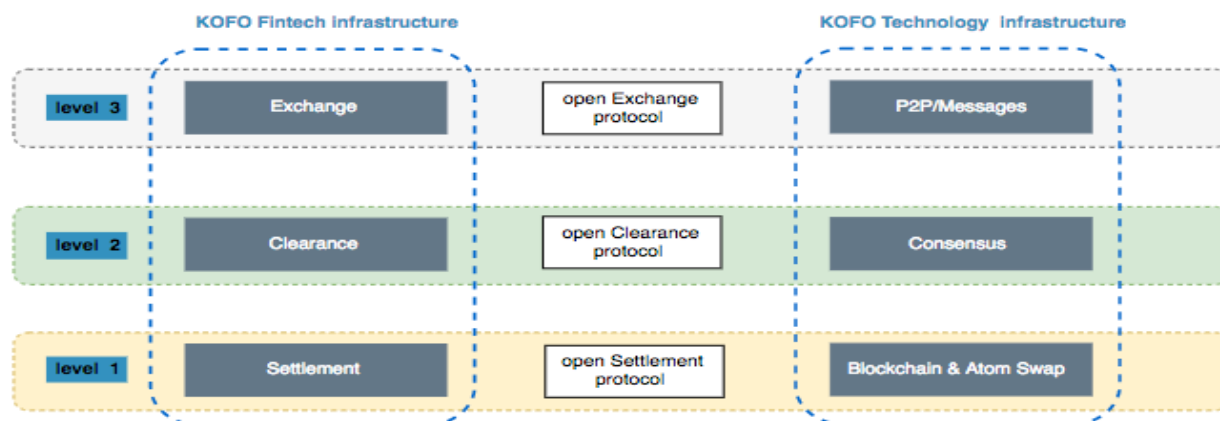


Figure3: KOFO three function module

### 3.2 Layer 1 技术要点：Blockchain & Atomic Swap

#### 3.2 Technical essentials of Layer 1: Blockchain & Atomic Swap

KOFO 实现结算功能依赖于多链原子互换技术。多链原子互换实现方案有多种，KOFO Settlement Protocol 的选择是基于 hash-lock 的多链原子交换。这种实现方式总体的特点是在保证安全的前提下，兼顾性能提升和扩展的便利性，极大的简化多链交互的复杂性，利于部署和实际的应用。hash-lock 跨链原子交换可认为是一种“条件支付”的协议，即如果满足条件，即可以完成支付过程，所以 KOFO 不仅适用于区块链资产的交易，同时也可适用于传统金融领域的其他产品。

**The settlement function of KOFO depends on the multi-chain atomic swap technology.** Many schemes can realize multi-chain atomic swap, and the choice made by KOFO Settlement Protocol is multi-chain atomic swap based on hash-lock. The overall feature of this implementation is that it can greatly simplify the complexity of multi-chain interaction and facilitate deployment and practical application under the premise of ensuring safety and taking the convenience of performance improvement and expansion into account. Hash-lock cross-chain atomic swap can be considered as a “conditional payment” protocol, that is, if conditions are met, the payment process can be completed, so KOFO is not only applicable to transactions of Blockchain assets but also other products in the traditional financial field.

KOFO Settlement Protocol 主要包括两个功能模块：

KOFO Settlement Protocol mainly consists of two function modules:

- Client 子系统，部署在不同的链上用于生成各类型交易、接收消息、提供 API 用于钱包集成等；
- Client subsystem, deployed on different chains to generate all kinds of transactions, receive messages, and provide API for wallet integration, etc.;
- Status monitoring 子系统：提供消息订阅服务，用于处理跨链原子交易过程中的超时处理和惩罚逻辑，用于监控各个链上的交易生成保证状态正确性。
- Status monitoring subsystem: The message subscription service is provided to handle timeout processing and punishment logic in the process of cross-chain atomic transaction, and to monitor the transaction generation on each chain in order to ensure the correctness of status.



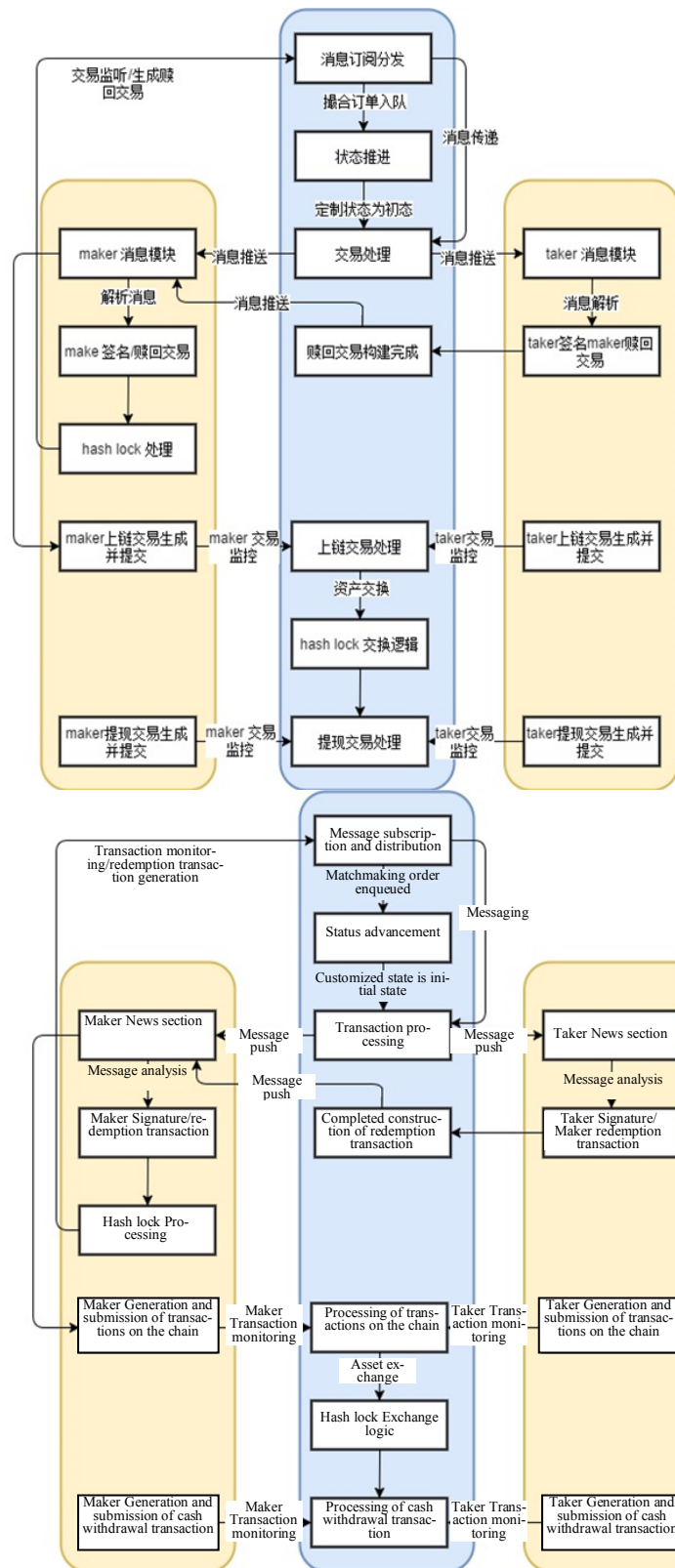


Figure 4: KOFO Settlement Protocol process

KOFO Settlement Protocol 同时定义了多链互换的 3 层标准：区块链适配层标准、跨链协议报文标准、跨链对接处理标准。通过区块链适配层标准，在支持脚本、智能合约的平台上，KOFO 可以方便的构建满足跨链标准的链上交易；通过跨链协议报文标准和对接处理标准，接入新链时只需要在标准处理流程中对 KOFO 协议报文进行解析，根据协议规定调用区块链适配层完成链上交易构建即可。KOFO 支持任意两个币种之间的互换，同时支持多对多的资产互换，使多个资产对之间的流动性形成一张网络。

KOFO Settlement Protocol also defines a three-layer standard for multi-chain swap: Blockchain adaptation layer standard, cross-chain protocol message standard and cross-chain coordination processing standard. Through the Blockchain adaptation layer standard and on the platform supporting scripts and smart contracts, KOFO can easily build transactions on the chain that meet the cross-chain

standard; Through the cross-chain protocol message standard and the coordination processing standard, we only need to analyze the KOFO protocol message in the standard processing process when accessing the new chain, and transfer the Blockchain adaptation layer to complete the transaction construction on the chain according to provisions of the protocol. KOFO supports the exchange between any two currencies, and also supports many-to-many asset swap, so that a network of liquidity among multiple pairs of assets is formed.

### 3.3 Layer 2 技术要点：clearance 机制

#### 3.3 Technical essentials of Layer 2: Clearance mechanism

清算的基本内容可概括为帮助结算层实现确定的结算订单和交换层实现账务信息确认。抽象化的需求包括:

The basic content of clearance can be summarized as helping the settlement layer realize the determined settlement order and helping the exchange layer realize the confirmation of accounting information. Abstract requirements include:

- 结算订单一旦生成就无法篡改;
- Once the settlement order is generated, it cannot be tampered with;
- 交易账务数据的确认;
- Confirmation of transaction accounting data;
- 足够的关键信息的隐匿性;
- Concealment of sufficient key information;
- 按照各方的付出对收益进行分配。
- Distribution of earnings according to the efforts of the parties.

KOFO Clearance Protocol 采用一套快速、全面、安全的算法，多方确认达成数据一致，无论账务信息、利益分配信息、结算订单信息都无法进行篡改。KOFO Clearance Protocol 同时是一个开放的协议，只要具备提供订单簿的能力，都可以加入到 KOFO 的 Clearance protocol 中，为所有的信息安全保证做出贡献，并且从中得到激励。KOFO clearance protocol 是一个分布式系统，每一个节点叫做一个 Validation，因此，每个 validation 包含完全一致的数据，其中也涉及各个 validation 的隐私数据，这些信息需要通过技术手段进行隐匿，比如同态加密技术。

KOFO Clearance Protocol adopts a set of fast, comprehensive and safe algorithms, the consensus on data through the confirmation of multiple parties is reached, which cannot be tampered with regardless of accounting information, benefit allocation information, settlement order information. KOFO Clearance Protocol is also an open protocol. As long as it's able to provide the order book, it can be added to the Clearance protocol of KOFO to contribute to the safety of all information, and get incentives from it. KOFO clearance protocol is a distributed system, and each node is called a Validation, so each validation contains the completely consistent data, which also involves privacy data of each validation. This information needs to be hidden by technical means, such as homomorphic encryption technology.

Figure 5: KOFO Clearance Protocol process

### 3.4 Level 3 技术要点：P2P network & messages

#### 3.4 Technical essentials of Layer 3: P2P network & messages

KOFO 通过构建一个 P2P 网络及消息系统保证交换层的目标达成，该系统可以使不同的资产能够在交换层得到发现，包含资产上架和价格发现，并确保交换能够成功。KOFO 作为一个数字资产交换网络，只要交易标的满足一些基本的定义，比如，针对某种交换资产的价格确定、手续费确定、交换规则（是否能够支持部分成交）确定等等，即可支持交易，所以 KOFO 可支持的金融资产既包含数字资产，也包括传统金融行业资产如衍生品资产、固定收益类资产等等。

KOFO ensures the realization of goals of the switching layer by constructing a P2P network and message system, and this system enables different assets to be found in the exchange layer, including assets on the shelf and price discovery, and ensures that the exchange can be successful. As a digital asset exchange network, as long as the subject matter of the transaction meets some basic definitions, such as price determination for certain exchange assets, handling fee determination, exchange rules (whether it can support partial transaction or not), etc., KOFO can support transactions, so the financial assets KOFO can support include both digital assets and assets in the traditional financial industry, such as derivative assets, fixed-income assets, etc.

资产在 KOFO 网络上按照协议进行发布以后，采用 claim-fulfill 机制完成撮合，即通过 P2P 网络进行消息传播，并基于独特的算法记录其经历的 node 信息，但这些 node 信息仅以签名的形式存在，以免会有敏感信息泄露。最终，原始的 node

和对手方 node 完成撮合，通过这种方式，交换路径的不可篡改性得到了保证并最终完成价格撮合。撮合一旦完成，会沿着交换路径反向回到最初的发起方，此时，发起方有机会进行选择（选择对自己最为有利的对手方），接着就生成一个固定的结算订单，写入共识层，共识成功，则订单已经无法篡改，系统会按照要求，清算所有的账务数据，其中也包含参与各方的手续费分润；同时，会生成基于对手方地址的结算订单，通过结算层完成结算。

After the assets are released on the KOFO network according to the protocol, the claim-fulfill mechanism is used to complete matchmaking, that is, messages are spread through the P2P network, and the node information is recorded based on the unique algorithm it has been through, but this node information only exist in the form of signature to avoid the leakage of sensitive information. Finally, the original node and the counterparty node complete matchmaking. In this way, the irrevocability of the exchange path is ensured and price matchmaking is completed in the end. Once the matchmaking is completed, it goes back along the swap path back to the original initiator in an opposite direction. At the moment, the initiator has the opportunity to choose (choose the counterparty that is best for him), and then a fixed settlement order is generated and written into the consensus layer, consensus is successful, and then the order cannot be tampered with. The system will be required to clear all the accounting data, which also includes the sharing of profits in the handling fee of parties involved; Meanwhile, settlement orders based on the addresses of counterparties will be generated, and the settlement will be completed through the settlement layer.

## 四、业务形态

### IV. Business form

KOFO 三层技术架构分别对应着三种类型的服务，KOFO 为这三层服务都分别提供了相应的协议，三层协议既可独立运行又可相互组合，满足各种不同的业务类型的需要，以下是分别对其业务形态的描述。

KOFO three-layer technical architecture corresponds to three types of services, and KOFO provides corresponding protocols for these three layers of services. The three-layer protocol can be operated independently and combined with each other to meet the needs of different business types. The following is a description of their business forms.

#### 4.1 结算

#### 4.1 Settlement

**数字资产交换是区块链生态的重要业务形式**，交易所、钱包、OTC 以及已经出现或正在出现的各种公链，他们分别基于各自的业务场景提供交换解决方案，如交易所、钱包和 OTC 分别都有不同形式的撮合系统并形成结算订单。KOFO 可以在上述众多场景中发挥结算功能。KOFO 的结算服务通过 SDK 提供，使得其可以和众多场景进行合作。一旦接入以后，上述业务模块就具备了跨链结算的能力，关键是这种能力并不依赖于任何区块链或人为的介入。

**Digital asset exchange is an important business form of the block chain ecology.** Exchanges, wallets, OTC and various public chains that have emerged or are emerging provide exchange solutions based on their business scenarios. For example, exchanges, wallets and OTC have different forms of matching systems and form settlement orders. KOFO can play settlement function in many of the above-mentioned scenarios. KOFO's settlement service is provided through the SDK, enabling it to work with many scenarios. Once connected, the above-mentioned business modules will have the cross-chain settlement capability. The key is that this capability does not rely on any block chain or human intervention.

钱包 Wallet	跨链结算增加了其交易属性，加强钱包 APP 的用户粘性，拓展其盈利模式 Cross-chain settlement increases its trading attributes, strengthens user stickiness of wallet APP and expands its profit model
OTC	场外交易撮合完成之后结算便利性大大提升 After the completion of over-the-counter trading matching, the settlement will be much more convenient
交易所 Exchange	跨链结算本身就使得当前的中心化交易所成为去中心化交易所 Cross-chain settlement itself makes the current centralized exchange a decentralized exchange
稳定币 Stable currency	多种稳定币的出现必然要求其交换能力的加强 The emergence of multiple stable currencies inevitably requires the enhancement of their exchange capacity
Token 借贷及衍生品业务 Token lending and derivatives business	配合智能合约使用，实现区块链金融的智能化和系统风险分散 It shall be used together with smart contracts, to realize the intellectualization of block chain finance and the decentralization of system risks

#### 4.2 清算

#### 4.2 Liquidation

KOFO 开放的清算协议将对所有的金融机构以及具有订单簿生成能力的机构开放，清算协议的开放性将对 KOFO 的流动性增强具有重要意义。

KOFO's open liquidation agreement will be open to all financial institutions and institutions with order book generation capability. The openness of the liquidation agreement will be of great significance to the liquidity enhancement of KOFO.

传统的金融机构快速接入 Fast connection of traditional financial institutions	无论银行、券商或其它专业经纪机构，都可以在无需对自己资产网络做大量改动（比如区块链化）的前提下，加入成为 KOFO 清算网络中的一个 validation，为整个 KOFO 的清算网络提供见证，并得到相应的激励。 Banks, securities traders and other professional brokers can join and become a validation of KOFO liquidation network without making extensive changes to their asset networks (such as block chain), to provide witness to the entire KOFO liquidation network and get the corresponding incentive.
客户易于资产交换配置 Facilitate customers' asset exchange allocation	传统金融机构的客户将非常容易的通过 KOFO 节点完成自己的资产交换，客户将有机会自主的完成自己的各类资产的配置，并随时可以调整资产配置。 Customers of traditional financial institutions will complete their asset exchange easily through KOFO nodes. Customers will have the opportunity to complete their own allocation of various assets independently and can adjust the asset allocation at any time.
提升金融机构的盈利能力 Improve the profitability of financial institutions	激活自己的客户，将反向有助于金融机构本身成为撮合对手方的提供者，通过交换手续费的分润，金融机构将大大拓展自己的盈利能力。 Activating one's own customers will in turn help financial institutions themselves become providers of matching counterparties. By distribution of profit of exchange fees, financial institutions will greatly expand their profitability.

### 4.3 流动性网络

### 4.3 Liquidity network

KOFO 开放的交换协议，将大大的推动交换层的适配性，加强其撮合能力，简化复杂操作，主要体现在以下几点：

KOFO's open exchange protocol will greatly promote the adaptability of the exchange layer, strengthen its matching capability and simplify complex operations, which is mainly embodied in the following points:

流动性拓展 Liquidity expansion	所有的拥有一定固有客户的机构均可以快速成为 KOFO 交换网络的交换对手方，共享其客户的订单簿，使得整个交换网络的流动性大大加强。 All institutions with certain inherent customers can quickly become exchange counterparties of the KOFO exchange network and share the order book of its customers, which greatly enhances the liquidity of the entire exchange network.
多种金融网络的桥梁 A bridge of multiple financial networks	对于已有金融产品如固收类产品、衍生品可以非常方便的接入 KOFO 网络，从而快速打通传统金融和数字金融的交换，这个过程不需要传统金融产品的区块链化，极大拓展了传统金融机构的业务 For existing financial products, such as fixed income products and derivatives can be easily connected to the network, so as to quickly open up the exchange between traditional finance and digital finance, which does not require block chain of traditional financial products, greatly expanding the business of traditional financial institutions

## 五、应用场景

### V. Application scenario

区块链作为价值互联网的技术基础架构将对金融领域的业务模式产生深远而重大的影响，KOFO 作为开放的数字资产交换网络其应用场景将随着区块链技术的应用落地而不断扩大和丰富。尽管 KOFO 可以支持多种数字资产的交换，但对 Token 类资产的支持是其首要目标。作为通证经济基本载体的 Token 其价值支撑在于其代表的特定场景下的权益，同时又因其可独立作为交易标的而具有交易属性，因此 Token 兼具权益属性和交易属性。KOFO 作为开放的数字资产交换网络，将紧密围绕 Token 的权益属性和交易属性设计业务场景，并结合 Token 从交易功能向权益功能转变的趋势多元布局，持续拓展。

As the technological infrastructure of the value Internet, block chain will have a profound and significant impact on the business model of the financial field, and application scenarios of KOFO, an open digital asset exchange network, will be expanded and enriched with the application of block chain technology. KOFO can support the exchange of multiple digital assets, but the support for Token class assets is its primary goal. Token, as the basic carrier of the token economy, is supported by the equity in the specific scenario it represents, and meanwhile, since it can be independently used as the subject matter of trading, it has trading attributes. Therefore, Token has both equity attributes and trading attributes. As an open digital asset exchange network, KOFO will design business scenarios closely around Token's equity attributes and transaction attributes, and will conduct multiple layouts and continue to expand combined with Token's transformation from trading function to equity function.

### 5.1 Token 交易类场景



## 5.1 Token trading scenarios

在交易功能方面，基于 KOFO 协议实现 OTC 和 DEX 的功能提升是最直接的体现，KOFO 已经实现了 BTC 和 ETH 的原子互换，通过开发者社区的建设，KOFO 将支持 EOS、USDT 以及大部分符合 ERC20 标准 Token 的跨链互换，基于 KOFO 有望在 2019 年 Q2 之前将 DEX 的交易范围扩大至数字资产市场约 70% 市值的资产。KOFO 同时制定了针对比特币网络的提速交易计划，即基于闪电网络的快速交易确认，届时，去中心化交易的用户体验和市场规模将得到极大提升。

In terms of trading functions, the improvement of OTC and DEX functions based on the KOFO protocol is the most direct manifestation. KOFO has realized the atomic exchange of BTC and ETH. Through the construction of the developer community, KOFO will support the EOS, USDT, and most of cross-chain exchanges that conform to the ERC20 standard Token, based on the expectation that KOFO will expand the DEX's transaction range to about 70% of the market value of the digital asset market before Q2 in 2019. KOFO has also developed an accelerated trading plan for Bitcoin network, namely the rapid trading confirmation based on the lightning network. At that time, the user experience and market size of decentralized trading will be greatly improved.

交易是区块链生态贯穿始终的重要功能，但交易的形态将随着区块链技术的不断成熟而更加丰富而多元。区块链生态在相当长的一段时间内将会是“多链共存”的状态，比如不同性能特点的公链，又如各个领域的垂直公链；跨链互换将发挥多生态系统间价值联通的功能，同时也将成为各个生态系统之间流量聚合的通道；而交易场景将可能分布在从用户端到功能端的各个场景比如钱包、社交以及各类 Dapp。KOFO 将是支持各个场景实现交易功能的“最轻量级”和“最完整流程”的基础设施。“最轻量级”是指 KOFO 完全基于原子互换实现资产交易，只需对接 SDK 接口即可实现交易功能，而无需组织中心化交易所运营所需的庞大资源，KOFO 的“轻量级”特点使其成为碎片化、场景化流量的理想入口。“最完整流程”是指 KOFO 完全基于原子互换实现资产交易，在用户体验基本相同的前提下，用户流失概率最低。目前一个普遍共识是去中心化交易速度慢、时间长，但是这种比较并不是基于用户体验的完整流程进行比较。试想钱包用户如果通过调用中心化交易所接口进行资产交易然后再通过资产上链回到钱包，实际上和通过去中心化交易所经历的过程是完全一样的，都是需要两个链上确认的时间，所谓“中心化交易更快”的观点实际隐含的意思是“从钱包用户到中心化交易所用户的流失”。基于以上分析，“最轻量级”和“最完整流程”是 KOFO 作为场景化交易基础设施的重要优势。

Trading is an important function of block chain ecology throughout, but the form of trading will be richer and more diversified with the continuous maturity of the block chain technology. The block chain ecology will be in a state of “multi-chain coexistence” for a long time, such as public chains with different performance characteristics and vertical public chains in various fields; Cross-chain exchange will play the function of value connection between multiple ecosystems and also become the channel of traffic aggregation between various ecosystems; Trading scenarios will probably be distributed in various scenarios from user side to function side such as wallet, social, and various Dapps. KOFO will be the “most lightweight” and “most complete process” infrastructure that supports each scenario to implement the trading function. “Most lightweight” refers to the fact that KOFO realizes asset trading completely based on atomic exchange, and it only needs to dock with SDK interface to realize trading function and doesn't need to organize the centralized exchange to operate the huge resources required. The “lightweight” feature of KOFO makes it an ideal entrance for fragmented and scenario traffic. “The most complete process” refers to that KOFO realizes asset trading completely based on atomic exchange, with the lowest user loss probability under the premise that user experience is basically the same. There is a general consensus at present that decentralized trading is featured by slow speed and long time, but the comparison is not based on a complete process of user experience. Imagine that wallet users conduct asset trading by calling the centralized exchange interface, and then return to the wallet through asset upper chain, which is actually the same as the process of decentralized trading requiring the time confirmed on the two chains. The so-called “centralized trading is faster” view actually implies “the loss of users from wallet to centralized exchanges”. Based on the above analysis, “most lightweight” and “the most complete process” are important advantages of KOFO as a scenario trading infrastructure.

## 5.2 Token 权益类场景

### 5.2 Token equity scenarios

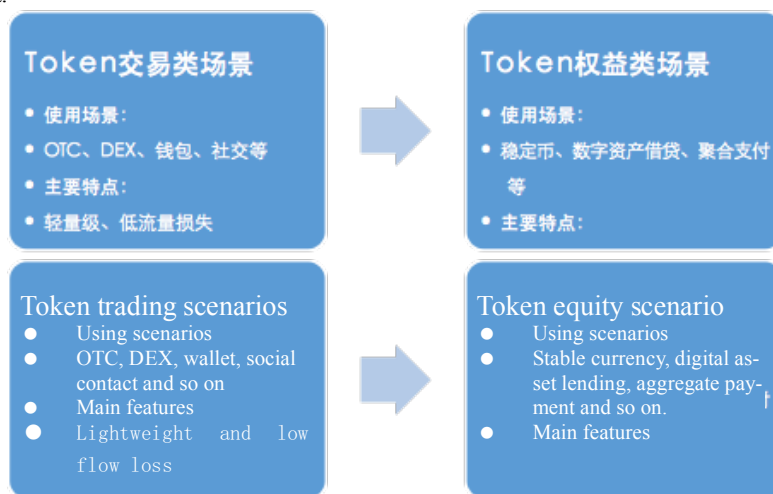
KOFO 更大的价值在于对 Token 权益属性的支撑。金融是区块链应用的重要领域，KOFO 的原子结算功能可以通过和智能合约的结合在金融产品创新，流程优化以及安全性能提升方面发挥重要作用。以稳定币为例，基于 Token 抵押发行稳定币是目前的一种重要形式如 MAKER DAO，通过 KOFO 的接入可以实现抵押币种范围的显著扩展，进而降低系统风险。试想仅以 ETH 作为抵押资产，实际上在 ETH 价格大幅下跌的时候，所有用户的抵押资产同时面临着同样的清算风险，如果将 BTC 扩展为抵押资产则上述风险将大大减少；与此同理，KOFO 也可为数字资产借贷业务发挥类似作用。

The greater value of KOFO lies in its support for Token equity attributes. Finance is an important field of block chain application. The atomic settlement function of KOFO can play an important role in financial product innovation, process optimization and security performance enhancement by combining with smart contracts. Taking the stable currency as an example, the issuance of stable currency based on Token mortgage is an important form at present, such as MAKER DAO. Through the connection of KOFO, the range of mortgage currency can be significantly expanded, thus reducing the system risk. Imagine that only ETH is used as a mortgage asset. In fact, when the price of ETH falls sharply, all users' mortgage assets are faced with the same liquidation risk. If the BTC is expanded to a mortgage asset, the above-mentioned risk will be greatly reduced; Similarly, KOFO could play a similar role for the digital asset lending business.

KOFO 对于 Token 权益属性的支撑还体现在赋予用户更大的资产配置灵活性方面。尽管权益属性是 Token 价值支撑的基础，但是为了使用而长期持有多种 Token 既不便利也不符合用户利益最大化原则。基于 KOFO 可使用户持有最具升值预期或者价格风险相对较低、流动性相对较高的数字资产，而在使用某种基于 Token 的功能是可以随时兑换。“多链共存”的特点使得区块链生态中聚合支付的需求远远大于的传统互联网经济，KOFO 这种兼顾 Token 投资属性和权益属性的特点使

其成为聚合支付的最佳入口。

KOFO's support for the Token equity attributes is also reflected in giving users more flexibility in asset allocation. Although equity attributes are the basis of Token value, holding multiple Tokens for a long time for use is neither convenient nor conforms to the principle of user benefit maximization. Based on KOFO, users can hold digital assets with the most expected appreciation or relatively low price risk and relatively high liquidity, while they can exchange at any time when using a function based on Token. The feature of "multi-chain coexistence" makes the demand for aggregation payment in the block chain ecology much greater than the traditional Internet economy. The feature that takes both Token investment attributes and equity attributes into account makes KOFO the best entry for aggregate payment.



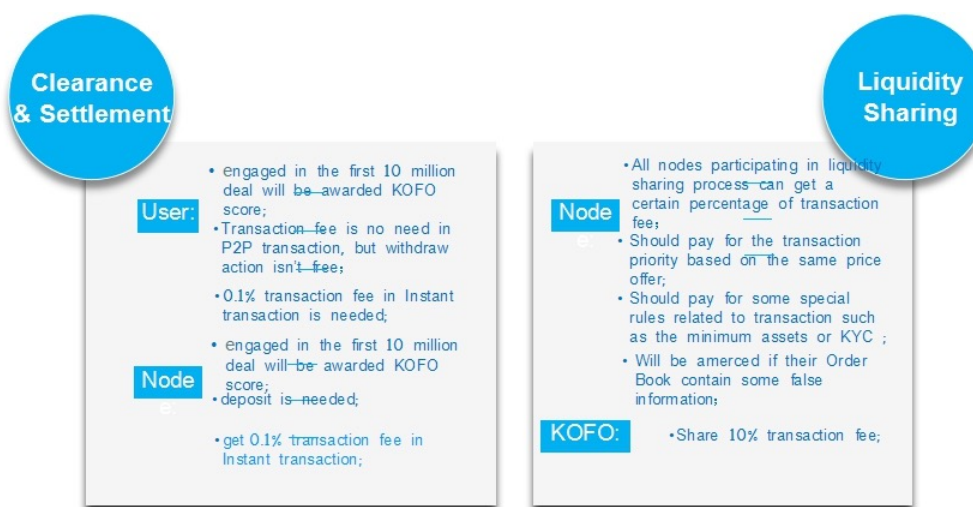
图示七 Token 权益类场景  
Figure 7 Token equity scenarios

## 六、经济模型

### VI. Economic model

KOFO 生态体系包括用户、各类 Validator 以及 KOFO 系统等主体，基于 KOFO 提供的清结算及流动性共享服务，KOFO 采用积分的形式对同时期对 KOFO 生态建设有积极意义的行为主体进行奖励如基于 KOFO 开展前 1000 万笔交易的用户和 Validator、积极、高效参与流动性共享的 Validator 以及开发者社区的贡献者，同时也会针对不利于 KOFO 生态效率提升的行为主体进行惩戒如 Order Book 虚假价格信息等。KOFO 基金会作为 KOFO 项目的发起人和 KOFO 生态建设的重要参与者将获得所有交易手续费的 10% 的使用权。

KOFO ecosystem includes users, all kinds of Validators, KOFO system and other entities, liquidation and settlement and liquidity sharing services based on KOFO. KOFO uses the form of points to reward the active actors of KOFO's ecological construction in different periods, such as users and Validators carrying out the first 10 million transactions based on KOFO, Validators actively and efficiently participate in liquidity sharing and contributors to the developer community; and meanwhile, it punishes those actions that are not conducive to the improvement of KOFO's ecological efficiency, such as Order Book false price information. As the initiator of KOFO project and an important participant of KOFO ecological construction, KOFO Foundation will obtain the right of use of 10% of all transaction fees.



图示八 KOFO 经济模型

Figure 8 KOFO economic model

## 七、Roadmap

## VII. Roadmap

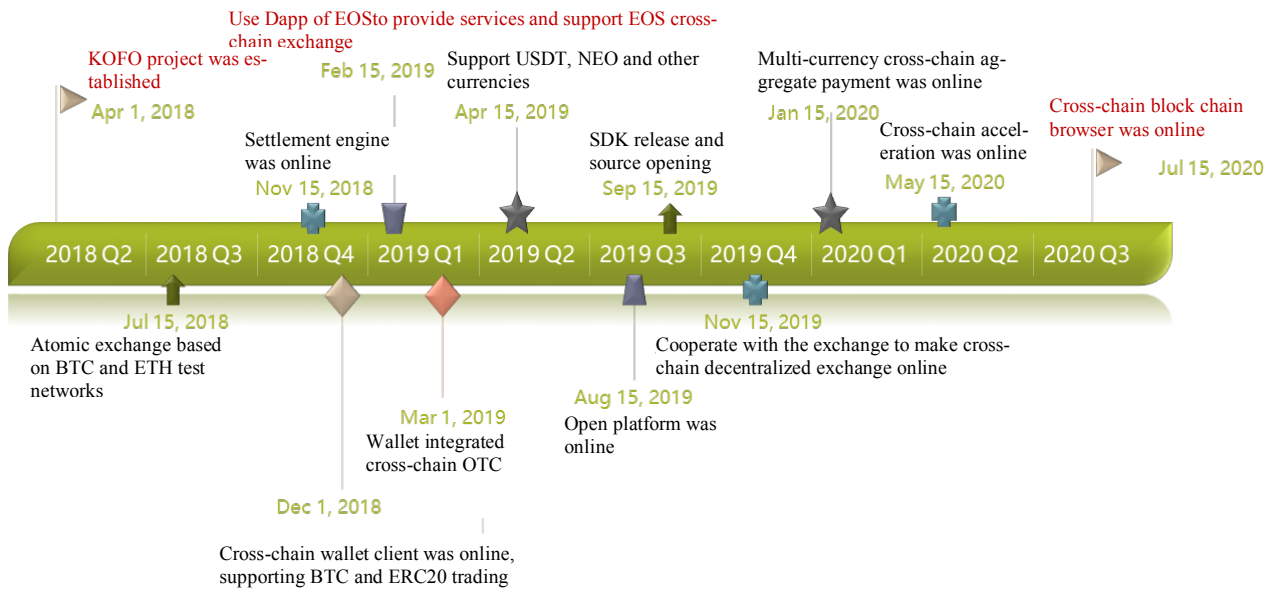
KOFO 项目立项于 2018 年 Q2，截至 2018 年 Q3 已率先实现基于 Bitcoin 和 Ethereum 测试网络的原子跨链互换，在此基础上，项目计划首先完成支持 BTC 和 ETH 原子互换的产品集成，以及扩大支持币种的数量，在充分发挥开发者社区成员作用的情况下，进一步实现 EOS 和 USDT 的原子互换，2019 年 Q2 之前，KOFO 将可以支持全球数字资产市值 70% 以上币种的原子互换。第二阶段，KOFO 将分步启动结算层和交换层协议的设计和开发，同时 KOFO 通过聚合支付进而聚合流量的功能也将更加凸显。第三阶段，KOFO 开发将聚焦在效率优化方面，基于闪电网络原理的跨链提速方案的实施，将使去中心化交易的体验大大提升，同时，基于 KOFO 协议独立区块链的产生，将对所有基于 KOFO 协议产生的交易进行链上记录，数字资产多链互换的安全性将得到进一步的提升。

KOFO project was initiated in Q2, 2018, and as of Q3, 2018, atomic cross-chain exchange based on Bitcoin and Ethereum test networks has been realized. On this basis, the project plans to first complete product integration supporting BTC and ETH atomic exchange, and expand the number of supporting currencies to further realize the atomic exchange of EOS and USDT while giving full play to the role of members of the developer community. Before Q2 in 2019, KOFO will be able to support atomic exchange of currencies of more than 70% of the world's digital asset market value. At the second stage, KOFO will start the design and development of settlement and exchange layer protocols step by step, and KOFO's capability to aggregate traffic by aggregate payment will become more prominent. At the third stage, KOFO development will be focused on efficiency optimization. The implementation of the cross-chain acceleration scheme based on the lightning network principle will greatly improve the decentralized trading experience. Meanwhile, the generation of independent block chain based on KOFO protocol will realize the recording of all transactions generated based on KOFO protocol on the chain, further improving the security of digital asset multi-chain exchange.

使用EOS的Dapp提供服务并支持EOS跨链互换







图示九 Roadmap

Figure 9 Roadmap

## 八、KOFO 社区

### VIII. KOFO community

#### 8.1 团队成员

#### 8.1 Team members

项目团对目前主要成员共 8 人，皆为技术研发经验丰富，且专长互为补充的资深开发人员。

The project team has 8 main members at present, all of whom are senior developers with rich experience in technology R&D and complementary expertise.

#### James Lee

从事技术研发与管理十余年，曾任职 Motorola、华为、中兴、阿里巴巴等国内外大型技术公司，拥有数年区块链底层技术和金融系统研发经验。

#### Michael Yang

曾任阿里云资深系统工程师、IAAS 系统负责人，获得发明专利两项。公司架构团队技术经理，主导公司技术架构领域、中间件等相关工作。

#### Abel Fan

前百度高级研发工程师。曾主导设计开发百度糯米电影订票服务系统，团购 api 服务等大型服务系统。

#### Wayne Dong

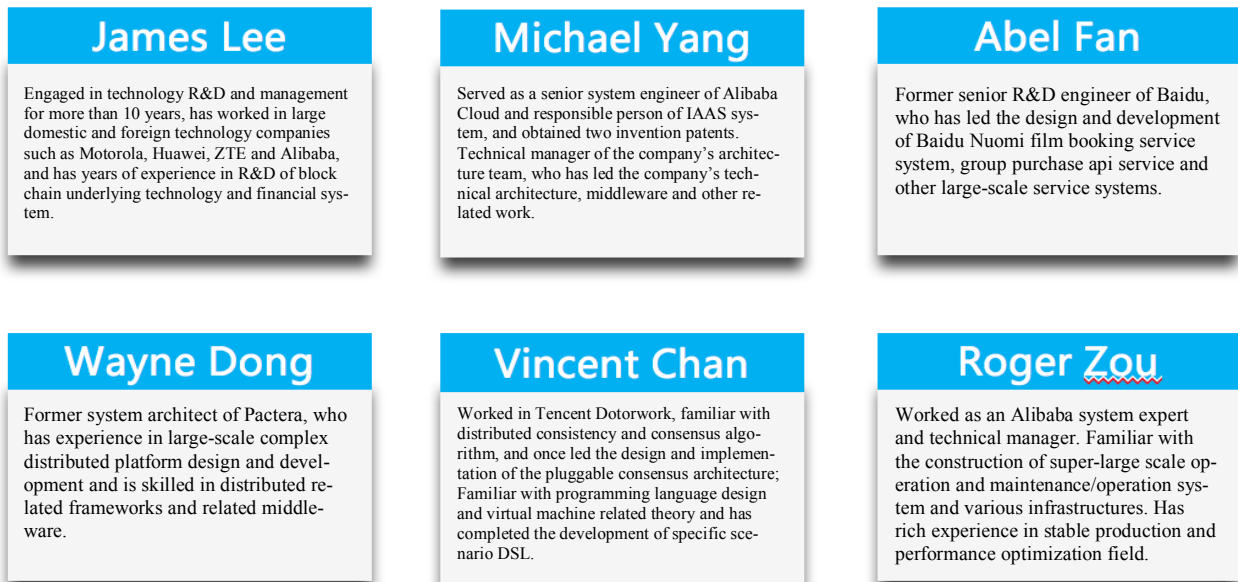
前文思海辉系统架构师，拥有大型复杂分布式平台设计与开发相关经验，熟练分布式相关框架及相关中间件。

#### Vincent Chan

曾任职企鹅医生，熟悉分布式一致性 & 共识算法，曾主导设计和实现可拔插共识架构；熟悉编程语言设计，虚拟机相关理论，曾完成开发特定场景的 DSL。

#### Roger Zou

曾任职阿里巴巴系统专家，技术经理。熟悉超大规模运维/运营体系建设，各项基础设施及基础架构。对生产稳定，性能优化领域有丰富经验。



图示十 团队成员

Figure 10 Team members

## 8.2 基金会

### 8.2 Foundation

KOFO 基金会是一家设立于新加坡并以 KOFO 社区化运营为目标的机构。KOFO 基金会负责 KOFO 项目战略规划、开发路线、生态建设等工作，将通过设立开发者社区全面推进 KOFO 可开发进度；通过设立生态合作者社区为 KOFO 协议构建的多元、丰富的生态体系。

The KOFO Foundation is an organization established in Singapore and takes community-based operation as the goal. The KOFO Foundation shall be responsible for KOFO project strategic planning, route development and ecological construction, and will comprehensively promote KOFO development progress through the establishment of a developer community. Responsible for setting up a diversified and rich ecological system through the establishment of an ecological partner community for the KOFO protocol.