

# **WHITE PAPER**

# **IBAX PUBLIC NETWORK -a**

**Next Generation WEB 3.0 Blockchain Network Infrastructure**

Issued by the IBAX Foundation

*Version 1.3.0      September 13<sup>th</sup>, 2022 Singapore*

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# 1. PREFACE

We pursue equality and freedom, but the world is full of deceit and lies. The advent of the blockchain technology is like a ray of sunlight passing through the haze to the ground! Facing the light, we unite into a torrent of will and shout to the world: decentralize, we can self-govern through voting; be open and transparent, hypocrisy and lies are about to end.

## 1.1 WHAT IS IBAX PUBLIC NETWORK

IBAX (Integrated Blockchain Asset Exchange) is a next-generation Layer1 Web 3.0 blockchain infrastructure designed to be a multi-functional Swiss Army knife in the blockchain space, providing a secure, efficient, scalable, low-cost and best-in-class BaaS for the ecosystem that builds on it.

IBAX runs on a decentralized proof-of-authority (DPOA) consensus mechanism based on Web 3.0 concepts with Real DAO governance.

## 1.2 CORE CONCEPT

- **Real DAO governance underlying blockchain**
- **Double channel transaction model (UTXO's transaction type and Smart Contract of Account model in parallel)**
- **Support for multiple types of eco-applications (DApps)**
- **Significantly reduce the cost of blockchain applications**
- **Self-built "physical" ecosystem**
- **Combination of optional eco-economic models**
- **Rapid deployment of distributed servers, development, and application environments**

- **Multiple types of application marketplaces (DAPP Store) and BaaS capabilities**
- **Real second-level business response**
- **Cross-chain and cross-system data interaction**
- **Customizable consensus mechanism**
- **Front-end and back-end separation to meet various encryption methods and requirements**
- **Zero barrier to entry to use**

## 1.3 VISION

The vision of the IBAX network is to create a secure, efficient, zero-tolerance fraud, and highly compatible open blockchain infrastructure. Giving the governance of the entire network back to the users, making blockchain not just for geeky developers or a few capitalists, but for all users as well.

## 2. IBAX ECO-GOVERNANCE

### 2.1 CONSENSUS MECHANISM

Consensus is the cornerstone of mutual trust in this collaborative society. We drive on a fixed side of the road, stop on red and go on green, and road consensus ensures our personal safety. In the economic sphere, we use the U.S. dollar as the primary settlement currency in international trade, and monetary consensus ensures commodity trading and economic development.

Is consensus inherent, or is it created? Accidents and car crashes were common before there was road consensus because we didn't know what each other was thinking and could only guess or anticipate through movements and glances. At one time people used gold and silver to trade freely instead of dollars (I don't intend to discuss the evolution of money here, which is informative but not relevant to the consensus we are exploring). There must be many reasons for our willingness to use dollars rather than gold and silver, but the most important one, the one that cannot be ignored, is the "consensus", the consensus that we recognize the value of the dollar to each other.

It follows that -

Consensus is not inherently present, but is formed in the process of mutual recognition.

In the blockchain world, the current Consensus Mechanism mainly consists of: Proof of Attorney (PoA), Proof of Contribution (PoC), Proof of Stake (PoS), Proof of Work (PoW), etc. as the mainstream consensus, of course, there are more other Consensus Mechanism.

After detailed analysis, each consensus is conformed to a specific scenario and specific rules, and no consensus can be applied to all environments, just as road consensus cannot be used interchangeably with economic consensus.

IBAX Public Network has built a new Consensus Mechanism - DPoA (Decentralization Proof of Attorney) from the perspective of business application scenarios and realistic environments.

The IBAX public network follows the principles of "democracy, freedom, equality, openness and transparency", and the governance authority of the blockchain network is shared by up to 101 "honorary nodes". We find that the "House of Representatives" system is still applicable in a decentralized world. This combination of popular election and centralized resolution has become a key system for the stable development of most democracies, where honorary nodes, like members of parliament, decide on IBAX matters by voting.

Given that honorary nodes have significant decision-making power in the IBAX network, honorary nodes need to actively apply and accept public voting for election. Honorary

nodes with the governance and decision-making power of the IBAX network should maintain the stability of the IBAX network and participate in the witnessing and verification of network-wide affairs.

In order to maintain the vitality of honor nodes for the stable development of IBAX network, therefore, the competition of honor nodes is happening all the time, and IBAX network will publish the dynamic packing number and packing rate, voting number and voting rate of honor nodes in real time. Efficient honor nodes will be ranked higher, and we believe that this ranking will give some reference meaning for the public to vote.

IBAX is, or perhaps should be (and we have been with humble hearts), the world's first blockchain underlying network architecture that truly implements DAO governance. In the foreseeable future, IBAX will lead the development of blockchain DAO governance, allowing blockchain networks to have not only decentralized applications, but also decentralized governance concepts!

## 2.2 ECO-GOVERNANCE CONCEPT

Blockchain was born out of the idea of finance and has grown from the development of eco-applications (DApps). Today's eco-applications (DApps), whether they are built on top of Ether, Solana ..... or any of the currently existing underlying blockchains (Layer 1), fail to address the idea of "decentralized" management. Even for the types of ecologies we know: DeFi, GameFi, NFT and even DEX, the creator of the ecology can modify the contract source code in the ecological application (DApp) at any time.

Any permission should be subject to public permission and unauthorized actions should be prohibited. Is the concept of "decentralized management" really realized in the 'community' built on timely communication tools, forums, and the website .....? The answer is obviously no, because the authority is still in the hands of the administrator.

The underlying IBAX blockchain truly implements the concept of "decentralized management", DAO governance no longer remains in the verbal agreement, but is written into the underlying code of the IBAX blockchain, which can be referenced by all ecological applications (DApps) created on the IBAX public network. DAO Governance in Model's ecosystem, the rights of the creator are bound to the voting permission of the governance board - a valid proposal requires a 68% approval rate out of 75% of the votes cast. The members of the governance board must be the top-ranked representatives of the ecology in terms of coin holdings, and in order to defend their interests, they will not pass any proposal that harms the ecology's interests.

The concept of "decentralized management" is based on the principle of mutual distrust and the separation of powers, and the concept of DAO governance allows each participant to participate in ecological governance on the basis of "decentralized management", and to jointly safeguard ecological interests and promote ecological development.

## 2.3 GOVERNANCE MODEL

Blockchain is an extension of the real world and a gateway to the virtual world for real social organizations, where people reconstruct a new kind of organization in a world that transcends the spatial and temporal dimensions. These organizations will definitely be a kind of centralized or democratically elected system. There will even be a centralized system overthrown by a democratic electoral system, or a democratic electoral system dictated by a centralized system. It is difficult to judge exactly which is better or worse, the democratic-electoral system or the centralized system, but only whether they are suitable for the current social environment. Therefore, the IBAX Public Network supports two Governance Models, "Eco-Founder Governance" and "Eco-DAO Governance", and allows switching between Eco-Governance Models under the rules of the current model. In addition, eco-creators can create their own governance models to suit their business needs. All governance models are open and transparent, and we display the governance models as IBAX network parameters on the blockchain network and blockchain browser to make the data information open and transparent to public scrutiny.

The creator management model is a model maintained and managed by the creator of the ecology, which is in line with the management of other ecological applications (DApps) on the blockchain as we know them today. The eco-creator has the right to modify and submit the source code of the eco-contract, and even increase the number of coins issued. The drawbacks of this management model are obvious, with overly centralized rights, incidents may occur to satisfy individual interests to the detriment of the group; however, the centralized management model allows flexibility to deploy new business contracts and modify incorrect parameters.

The eco-DAO governance model is based on the concept of decentralized management and shared governance by all members of the ecology, even the ecological creator does not have the right to modify any contract source code. Only the eco-developer can initiate the creation or modification of a contract source code. In the eco-DAO governance model, any new or modified contract source code by an eco-developer (unless the contract has been granted non-audit access) will result in a "proposal", which (contract details and contract source code) will trigger a vote by the governance committee, and once the vote is approved, the contract source code will immediately be Once the vote is approved, the contract source code will immediately take effect on the IBAX network. The DAO governance model has been working intelligently.

## 2.4 ECO-GOVERNANCE OBJECT

Just as we have different identities in different organizations in the real world, identities among ecologies are segregated from each other. The act of crossing ecological authority never happens, but someone who has or is given the identity of more than one ecology is entitled to exercise the corresponding rights in those ecologies.

## 2.4.1 ECO-CREATOR

The Founder is the initial builder of an ecology and the greatest contributor to the ecology. He is the creator who builds the basic framework of the ecology and determines the basic rules of the ecology. To thank the founder for his contribution to the ecology, we have given him the permanent naming right to the ecology and the permanent identity - Founder.

## 2.4.2 ECO-DEVELOPER

Eco-developer is a role that can be given to any member of the ecology. It is only possible to create or modify a smart contract in the ecology by having the eco-developer permission.

In creator-managed mode, new or modified smart contracts created or modified by eco-developers are effective upon submission to the chain.

Under the eco-DAO governance model, new or modified smart contracts created or modified by eco-developers will automatically generate proposals and submit them to the eco-governance committee members for review. New or modified contracts will become effective when voted on by the Eco-Governance Committee. Proposals that do not pass the governance committee vote will not be validated and will be rendered permanently invalid.

## 2.4.3 ECO-GOVERNANCE COMMITTEE

The Eco-Governance Committee is the original "Eco-House" of the DAO governance concept in the IBAX public network. They are recognized by the votes of the eco-members and represent them to defend their ecological interests and promote ecological development through voting.

In the eco-DAO governance model, the eco-governance committee can decide the members of eco-developers by voting. Let eco-developers submit applications for modifications of eco-smart contracts, which are reviewed and approved by the eco-committee.

There are many developers in GitHub who have extensive experience with blockchain technology and submit many effective code contributions. The Eco-Governance Committee can vote developers with exceptional contributions into the Eco-Developers, allowing these developers to efficiently build eco-applications.

## 2.5 IBAX FOUNDATION

The IBAX Foundation was established by several cryptography experts, blockchain experts, software engineering, business elites, and management talents to focus on developing, deploying, and maintaining the IBAX network. Foundation members to better promote the continued operation of the IBAX public network and breakthrough innovation. The Foundation needs to continuously upgrade and update the IBAX public network, the next generation of decentralized algorithms, we hope to achieve by way of cryptographic software protocols, including homomorphic encryption, lattice cipher and other technologies. As can be seen by the members of the Foundation, we are balanced between technology and business applications, and the members complement each other.

In order to bring the IBAX Public Network to full scale in its current technology stack, the Foundation needs to research, develop, deploy, fund and maintain IBAX-related technology innovations on an ongoing basis. To better support 'eco-partners' and 'developers', the IBAX Public Network provides a powerful visual development and deployment tool (IDE), which we call "WEAVER ". (<https://weaver.ibax.network/>)

The Foundation is governed by fair and equitable principles and has a clear and unambiguous governance charter. At the same time, the Foundation is governed by a Board of Directors that is responsible for the execution of specific matters and also shoulders major strategic matters of a technical and operational nature. Board members are generally represented through the Foundation's subcommittees, which are theoretically elected once a year.

In order to promote the continuous development and progress of the IBAX blockchain, the Board of Directors will select functional committee heads to oversee the various operating divisions of the Foundation, and the committee will take into account the interests of all parties in the entire IBAX blockchain network.

The purpose and functions of the initial establishment, including but not limited to

- Consideration and revision of the foundation's charter and governance principles;
- The development, consideration and adjustment of major strategic decisions of the Foundation.
- Core technical changes and upgrades to the IBAX network.
- Development, consideration and adjustment of the nomination and election process for the Foundation's President, Board members, and heads of functional committees.
- Review, approve and monitor the Foundation's annual budget, financial position (including all ecological asset holdings), use of proceeds and its major transactions;

- Initiating and organizing network-wide voting on major matters on the IBAX network, such as fundamental adjustments to the Consensus Mechanism or technical parameters.
- The Development Committee will make decisions on urgent matters of a temporary nature and other matters that the Development Committee deems necessary for a network-wide vote;

Committee stakeholder members and employees shall not receive additional cash compensation for their service on the Committee. Members serving on the Board or the Foundation will be rewarded with a fixed percentage of tokens or eco-tokens after passing a review.

## 2.6 ECO-PARTNERS

Ecological partners include but are not limited to

- Government agencies, enterprises, individuals, developers, where the ecological development and operation based on IBAX provides products or service entities for the whole ecology or a single ecology.
  - Participate in the governance of the chain structure with node packaging, verification, broadcasting and node operation and maintenance, and participate in securing the entire network. At the same time, it will be open to run the supporting infrastructure services of the selected nodes.
- ① In the form of mining and holding coins, directly participate in the whole blockchain governance network, participate in undertaking to maintain the security of part of the network, and have the right to participate in the decisive development of part of the ecology. Forms such as: nominations, community governance voting, contract auctions, modification proposals, etc.
  - ② The state system community partners can have the right to vote, represent and suggest in terms of application ecology construction, dissemination, etc. through the self-cornered approach.

## 2.7 ECO-ECONOMIC MODEL

The development of blockchain applications (DApps) has not been able to get rid of the basic Gas fee incurred when using blockchain networks. Regardless of the applications built on the underlying blockchain (Layer 1), they all need to pay Gas fee with basic tokens. The purchase of base tokens increases the operational difficulty and threshold for new blockchain users, making it impossible to implement many business scenarios in the real world on the blockchain network.

IBAX public network is designed to meet different types of eco-partners and complex business scenarios. We have designed multiple Gas fee payment models to support users in DApps without using IBXC tokens.

- The Eco-token Model: This model allows users in a DApp to pay for Gas fees using Eco-tokens. The Eco-token paid by the user will be collected by the eco-exclusive wallet, which in turn will pay IBXC as the user's base Gas fee. And the ratio of this exchange is determined by the ecological smart contract. In short, the user pays the Gas fee with the eco-tokens, and the eco-exclusive wallet collects this fee while paying the base Gas fee on behalf of the user.

ECO Token: HJK	Total Supply: 500,000,000 HJK	Current Circulation: 500,000,000 HJK	Deduction Model: Eco Withholding Settlement
Increaseable: Yes ⓘ	Additional Issue Volume: 0 HJK	Destructible: No ⓘ	Destroyed Amount: 0 HJK
Eco-tax Rate: 300% ⓘ			
Element Creation Fee: Self-Pay			
Contract Execution Fee: Paid by Withholding Account		Contract Execution Fee Conversion Ratio: 100 %	
Data Storage Fee: Paid by Withholding Account			Storage Fee Conversion Ratio: 100 %
Expedite Fees: Self-Pay [Customized Payment]			
Withholding Model: Partial Withholding	Withholding Account: 1491-6019-9155-5445-7510	Is GAS fee burnable or not: No	Burned Amount: 0 HJK GAS fee burning ratio: 0 %

(Eco-Deductible Model - IBAX Blockchain Viewer Real Screenshot)

- Full amount of tokens model: Any Gas fee generated in the ecology is paid by the designated ecology exclusive wallet on behalf of the user, and no user tokens are charged. This model greatly reduces the threshold for users and is a means to quickly attract user experience. It must be mentioned that there is no cap on the rush fee, so it is best to turn on the rush fee collection when using this method.

- Part of the ecological deduction model: Gas fee is divided into creation element fee, contract execution fee, data storage fee, and expediting fee, and different percentages of these fees can be set according to the requirements of ecological applications (DApps). For example, if the contract execution fee needs to be charged additionally, the percentage of this fee can be enlarged.

User Address:	0313-4279-7008-9638-4415	to	0404-3454-2329-7827-8010
<hr/>			
Transaction Type: Transfer			
<hr/>			
Amount:	10 ERT		
<hr/>			
Gas Fee:	0.007489 IBXC		
<hr/>			
Expense Distribution	Gas Fee Detail		
<hr/>			
Expedite Fees	0	from	1491-6019-9155-5445-7510 Eco Withholding Settlement
Element Creation Fee	0	from	1491-6019-9155-5445-7510 Eco Withholding Settlement
Contract Execution Fee	0.003641 IBXC	from	1491-6019-9155-5445-7510 Eco Withholding Settlement
Data Storage Fee	0.003648 IBXC	from	1491-6019-9155-5445-7510 Eco Withholding Settlement
<hr/>			
Eco-Gas Fee: 0.037445 ERT			
<hr/>			
Expense Distribution	Eco-Gas Fee Details	Eco Withholding Settlement	
<hr/>			
Expedite Fees	0 ERT ⓘ	from	500 % [ Eco-tax Rate ]
Element Creation Fee	0 ERT ⓘ	from	0313-4279-7008-9638-4415 500 % [ Eco-tax Rate ]
Contract Execution Fee	0.018205 ERT ⓘ	from	0313-4279-7008-9638-4415 500 % [ Eco-tax Rate ]
Data Storage Fee	0.01924 ERT ⓘ	from	0313-4279-7008-9638-4415 500 % [ Eco-tax Rate ]

(Part of the eco-deductible model - real screenshot of IBAX blockchain browser)

- User Paid Model: The user pays the base Gas fee.

User Address:	0424-9654-7885-5979-6721
<hr/>	
Gas Fee: 0.013625 IBXC	
<hr/>	
Expense Distribution	Gas Fee Detail
<hr/>	
Expedite Fees	0
Element Creation Fee	0
Contract Execution Fee	0.01138 IBXC
Data Storage Fee	0.002245 IBXC

(User Paid Model - IBAX Blockchain Viewer Real Screenshot)

In addition to the diversity of eco-deduction models, you can also design different monetary regimes according to the requirements of the eco-application (DApp). Whether it is a deflationary economic model, an inflationary economic model or a constant economic model.

- Burning ecological Gas fee: Burning the Gas fee for each transaction within the ecology in a set ratio, and the burned ecological pass will be destroyed. This is a deflationary economic model.
- Destruction of tokens: Active destruction of eco-tokens or transferring money to a black hole address (0000-0000-0000-0000-0000) are both acts of destroying eco-tokens, which is an economic model of active deflation.
- incremental Eco-Tokens: Incremental Eco-Tokens are issued based on contractual conditions, and in the case of the Eco-DAO governance model, permission to vote from the Eco-Governance Committee is required. This is an inflationary economic model.
- No incremental issuance, no burning, no destruction of tokens: DApps will never incrementally issue, burn and destroy eco-tokens. This is an economic model with a constant number of eco-tokens.

### 3. A MORE EQUITABLE, TRANSPARENT, FRAUD-PROOF, AND SUSTAINABLE ECONOMIC MODEL

One of the core issues of economics research is the rational allocation of scarce resources, which is also true in a public blockchain network, where bandwidth, storage, computing power, etc. of the public chain are all scarce resources. Out of deep thinking about the contradiction between autonomy and commercialization, IBAX developers believe that for a public blockchain network, there is no theoretical threshold for participation in the network or to some extent it should be low enough that all participants in the network may only consider their own interests, and these behaviors may be harmful to the IBAX value system in the short term, but for the commercial scenario, it is not a good market regulation mechanism.

The social nature of IBAX public network is a fair market platform for value flow and circulation, and any facility within each ecology in the platform can theoretically become a value resource. At the same time, in the integrated blockchain system structure system, it can be combined with the hardware system, thinking in terms of actual business needs and sustainable socio-economic model, providing an entrance for decentralized data flow transaction and storage services, and ensuring the authenticity and reliability of data flow transactions and the integrity and recoverability of stored data through the technical level.

In order to prevent the occurrence of fraud and other malicious events that are common in the existing blockchain world, the IBAX network combines economic theories and scenario requirements in the technical implementation of the most advanced cryptographic technologies such as homomorphic encryption, asset locking, smart contracts, zero knowledge proof, unreadable secret key pairs (smart contract encryption) cross-chain mechanism, multi-chain isolation, etc., to ensure to the maximum extent that the IBAX public network on the Eco-bank, Eco-cluster projects are more fair, transparent, fraud-free, and sustainable.

The native crypto digital currency in IBAX acts as a medium of exchange within the IBAX ecosystem, and is also the basic accounting unit for measuring the value of all ecological services, such as: ecological set-up base fees, application development on-chain fees, contract call fees, etc. Specific fees can be found on the IBAX web browser.

All previous publications shall be deemed to have been withdrawn and superseded by this document.

## 3.1 EXECUTION SUMMARY

The IBAX token (IBXC) is the underlying settlement unit of the IBAX network. IBAX has two main functions on the IBAX PUBLIC NETWORK (IBAX Public Network).

- ① IBXC can be used to pay for services on the network, including the creation of "Ecosystems", the import of smart contracts and database tables, the Gas Fee for on-chain transactions, etc.
- ② With IBXC as the settlement unit, it can be used to protect the network from attacks.

## 3.2 OVERVIEW OF THE IBXC

This section covers some security considerations regarding the use of IBXC tokens, the Decentralized Proof of Authority (DPoA- Decentralized Proof of Authority), the Mint Node, and key details on how to implement and maintain network security and public control.

### 3.2.1 TRANSACTION FEES

All blockchain network operations that require a change in ledger status, such as transactions, Eco-bank creation, token creation, smart contract creation and import, database table creation and import, on-chain message sending, casting pool node creation, UTXO transactions, etc. must be settled with the IBXC transaction fee.

The above types of blockchain network transactions pay varying amounts of fees to the verifying party depending on the type of transaction, which establishes a strong and positive direct relationship between increasing token liquidity and network usage frequency.

In order for the IBAX network to have mass participation and wide access to the benefits of the network, the economic model is designed with a diversity of public participation and a specific breakdown in transaction fees (Transaction Fee), which can be divided as follows.

#### 3.2.1.1 Gas Fee

As a mode of operation of an integrated blockchain that secures the network, Gas fees are a necessary form of existence and a way of presenting the fees of all public blockchains today.

IBAX's business processing performance and network usage efficiency are complex and efficient, and to meet these business characteristics, we have broken down the fuel cost (Gas Fee) into four components in terms of economic consumption.

$$TP \times ElementRate \times FuelRate + BlockSizeCost$$

**TP** - TP is the unit of fuel that needs to be burned up for each operation and operation in the IBAX Virtual Machine (IVM).

**FuleRate** - FuelRate is the fuel rate. Use the fuel rate to convert fuel units to qIBXC with a value of 1,000,000.

**ElementRate** - ElementRate is an element rate that applies only to special smart contract fees and has a value of 1,000,000. The special smart contract fee is calculated as Resource Fee.

**BlockSizeCost** - BlockSizeCost is a fee based on block size and applies only to the block size fee, which is 15,000,000,000,000,000 qIBXC per 1048576 bytes.

The specific calculation formula is as follows.

- *ElementRate* and *BlockSizeCost* charges are not included

$$1 \text{ IBXC} = 1,000,000,000,000 \text{ qIBXC} = 1 \text{ (TP)} \times 1,000,000 \text{ (ElementRate)} \times 1,000,000 \text{ (FuelRate)}$$

- Includes *ElementRate*, not including *BlockSizeCost*

$$1 \text{ IBXC} = 1,000,000,000,000 \text{ qIBXC} = 1 \text{ (TP)} \times 1,000,000 \text{ (ElementRate)} \times 1,000,000 \text{ (FuelRate)}$$

- *ElementRate* is not included, only *BlockSizeCost* is included

$$1 \text{ IBXC} = 1,000,000,000,000 \text{ qIBXC} = 1 \text{ (TP)} \times 1,000,000 \text{ (FuelRate)} + \text{BlockSizeCost}$$

- Includes *ElementRate* and *BlockSizeCost* fees

$$1 \text{ IBXC} = 1,000,000,000,000 \text{ qIBXC} = 1 \text{ (TP)} \times 1,000,000 \text{ (ElementRate)} \times 1,000,000 \text{ (FuelRate)} + \text{BlockSizeCost}$$

### 3.2.1.2 Resource fee

The Resource Fee is classified as a "special smart contract fee" in the above billing formula. As an IBAX public network that is robust enough to take over all existing Internet services, it is designed to be operationally viable and highly reliable in terms of architecture and functionality, and therefore offers a variety of resources available and ways to use them. The Resource Fee is classified as a "special smart contract fee" in the above billing formula. As an IBAX public network that is robust enough to take over all existing Internet services, it is designed to be operationally viable and highly reliable in

terms of architecture and functionality, and therefore offers a variety of resources available and ways to use them.

RESOURCE FEE CATALOG			
Type	Contract Name	Estimate Pricing (IBXC)	Recipients
Create Contract	@1NewContract	1	Honor Node
Create Table	@1NewTable	1	Honor Node
Create Column	@1NewColumn	1	Honor Node
Create Ecolib	@1NewEcosystem	100	Honor Node
Create Menu	@1NewMenu	1	Honor Node
Create Page	@1NewPage	1	Honor Node
Create Code Segment	@1NewBlock	1	Honor Node
Create Views	@1NewView	1	Honor Node
Create Application	@1NewApplication	1	Honor Node
Create Eco-token	@1NewToken	5,000	Honor Node

### 3.2.1.3 UTXO Trade Gas Fee

The IBAX public network has a dual-channel transaction model. The Smart Contract of the Account model has the ability to handle complex business and can write smart contracts for complex business or even multi-layer nested contracts, while the UTXO transaction has the characteristics of fast bookkeeping and associated transactions, which is a relatively simple and computationally light transaction method for business.

UTXO has the advantage of low transaction cost and high transaction volume compared with Smart Contract of Account model, and this advantage is more prominent in transfer business. It has been measured that the transfer transaction Gas Fee using UTXO type is 90% lower than the transfer transaction Gas Fee of Account model, and at the same time, UTXO can increase the transaction speed of the associated address hundreds of times because it uses concurrent processing mode.

$$\text{UTXO GasFee} = ( \text{TS} + \text{IS} ) \times \text{UTXORate}$$

**TS** – Transaction Size

**IS** – Input Size

**UTXORate** – Ecological base rate  $\times$  10%

### 3.2.2 STAKING CONSIDERATION

Staking is the process by which users lock in their IBAX tokens in order to participate in the IBAX public network and receive the corresponding rights. In the IBAX public network, different scenarios are available for staking: in the NFT Miner Mint process, the NFT Miner's arithmetic power is activated by staking to obtain the mint reward; candidate honor nodes become honor nodes by pledging a certain number of tokens to obtain packaged revenue and DAO governance rights; Mint Nodes are pledged to Mint Node guarantees the longevity of the data stored on the Mint Node and receives network rewards. Pledging tokens is an act, not a physical transaction (e.g., a node). The locked tokens will be used to participate in various corresponding transactions to complete the IBAX network's incentive inner loop and network security stability, which forms the core of running the IBAX public network.

### 3.2.3 MINTING CONSIDERATION

Minting tokens is the incentive behavior of the IBAX public network. In the IBAX network, we have designed a unique type of node that receives 30% of the total IBXC allocation, which is the Mint Node (Mint Node). Mint Nodes are run around the world by IBAX network participants, and stand on their own as distributed servers and provide decentralized services to various Ecosystems (Ecosystems), such as decentralized social tools, decentralized web services, etc. A simple example of why mint nodes are so important: when a GameFi game asset with high value exists on the blockchain, its asset value is predicated on the game service itself, and when the game fails to provide the service, its asset will be worthless, resulting in heavy losses for the asset owner (this is an instance that has happened many times). The Mint Node stores not only GameFi's contract source code, but also GameFi's assets and NFT credentials. Even if the game operator no longer provides the service, the game itself running on the Mint Node is still running, making the game assets have permanent value. Thus, the Mint Node is one of the core parts of the entire IBAX public network.

The minting process of the Mint Node (Mint Node) needs to be coupled with the user's token collateral (Staking) in order to proceed. This model is conducive to improving the liquidity of the system token IBXC, and also incentivizes users to run the Mint Node for the entire IBAX network's full ecological library and ecological cluster.

### 3.2.4 IBAX COIN INFORMATION

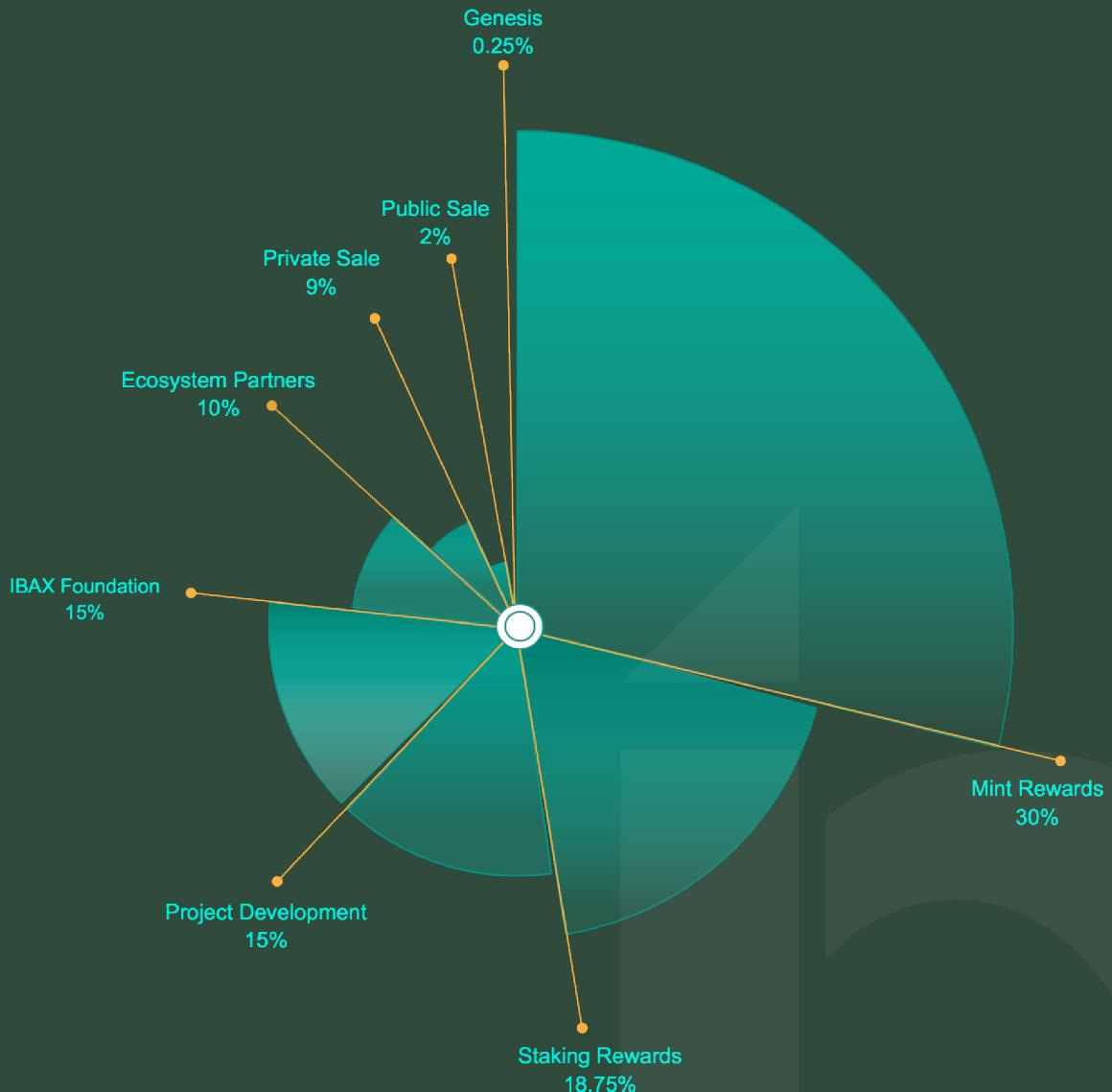
To ensure the healthy operation of the IBAX public network, there are five key components described in the "Unlocking Schedule" section of IBAX's Fund Raising Instructions document, where the composition of the IBXC tokens is detailed.

- \* **Total IBXC Supply:** 2,100,000,000 IBXC
- \* **Block Out Time:** block/4 seconds
- \* **Total Block Generation Rewards:** 1,233,750,000 IBXC
  - **Metaverse Block Bonus (NFT Miner Mint):** 25 IBXC/block
  - **Mint Node Rewards:** Accounted for by the size and volume of data stored
- \* **Genesis Block:** 0.25% of the total IBXC (secured by IBAX network programming and smart contracts, deployment of original smart contract groups, etc., which drive and secure the operation of the IBAX public network, fundraising, initial ecological cooperation)
- \* **Meta-universe Halving Cycle:** specific five halves based on the number of NFT Miner activations, the first halve for the 80,000th NFT Miner, the second halve for the 320,000th, the third halve for the 1,280,000th, the fourth halve for the 5,120,000th, and the last halve for the 20,480,000th, and thereafter Constant output.
- \* **Mint Node (Mint Node) reward halving cycle:** 2 years (can be amended according to the main network consensus for network-wide voting)
- \* **Meta-universe Reward rules:** with the amount of collateral, according to the meta-universe NFT Miner unique attributes in the energy points comprehensive calculation, randomly rewarded single wallet address.
- \* **Mint Node Rules:** The amount of Stake is rewarded to the Mint Node wallet address in accordance with the Mint Node's base integrated computing power.
- \* **The Basic Integrated Arithmetic Calculation Parameter Dimension of The Mint Node Contains:** Storage data volume size, usage traffic, pledge time, pledge quantity, CPU, memory, bandwidth, etc.

### 3.2.5 COIN DISTRIBUTION

In order to ensure the long-term commitment of key parties, holdings and participation in all actions that enhance liquidity, the 2.1 billion IBXC tokens issued at the birth of the network will be subject to an automatic unlocking schedule. When implemented, these schedules will be automatically enforced by the IBAX network by means of programming and smart contracts, thus ensuring that no human intervention is possible.

- \* **Initial ecology: 0.25%** (Direct release)
- \* **Mining: 48.75%** (NFT Miner Mint: 18.75% / Mint Node: 30% - Mint Node under development, opening time TBD)
- \* **Private Placement: 9%** (10% released after opening NFT Miner mining, the remaining part will be released linearly in 30 months after 12 months)
- \* **Public Offering: 2%** (Direct release upon completion of public offering)
- \* **Foundation: 15%** (8 linear releases in total, with the first release in the 7th month after opening NFT Miner mining and 1/8th every 6 months thereafter)
- \* **Eco-Partner: 10%** (Earmarked for 7 addresses, unlocked for the first 2 years after the main network is launched, and unlocked for the rest of the addresses on a yearly basis)
- \* **Team: 15%** (5.5 years linear unlocking, 1/60th per month starting from the 7th month after opening NFT mining)



The impact of these sales/distribution events on total public benefit control can be found in the subsequent Economic Model Description Document, as well as in the Fundraising Description Document.

As Foundation tokens are unlocked linearly at the end of the year following the official opening of NFT Miner Mint, if at any stage circulation drops below 67% of unlocked tokens, the Foundation will sell tokens in its token pool until circulation reaches 67% or more again. In order to ensure that the launch of IBAXPN-a brings us to a 25% public collateral ratio, the Foundation will still need to cede a percentage of the total supply, which is expected to be available for allocation through the marketplace after this article is published to web posting.

At the same time, the Foundation has allocated a percentage of tokens to ecology, developers and the community to further support and participate in the early IBAX public network ecosystem, and that percentage of tokens will be released in accordance with the relevant rules.

IBAX Foundation issues 0.25% of the total liquidity of IBXC tokens to start the IBAXPN-a network, including "distributed database table creation", "smart contract field creation", "importing smart contracts", etc., as well as for all transaction items such as fundraising and on-chain activities. Since the IBAX network is a contract-driven Web 3.0 blockchain underlying infrastructure, everything in the network requires IBXC as a Gas expense. After IBAXPN-a is running and before NFT Miner Mint is turned on, no new IBXC tokens are produced, so the IBXC that starts the network is important for network security, which we call the "security boot period", and after NFT Miner Mint is turned on After that, the remaining IBXC tokens can be used for collateral mining (Staking) and pledging and election of official honorary nodes.

### 3.3 FEE MODEL

#### 3.3.1 BACKGROUND AND MINDSET

Among today's popular and non-popular blockchain projects, there is basically only one payment model i.e. "whoever uses the smart contract pays the network Gas fee", which is unfriendly and does not conform to the basic consumption logic in real-world scenarios, and such a setup not only costs the ecological end-users extra Such a setup not only costs the end-user of the ecosystem extra costs, but also results in raising the threshold for the end-user to use the application (especially in combination with conventional payment methods, such as PayPal, etc.), which is the reason why global blockchain projects cannot be widely used by the public in the real world.

Therefore, the IBAX public network creates several different network base fees (Gas fees) that allow eco-creators/developers to focus on their own business, lowering the barrier of access for eco-users and allowing developers to quickly gain access to real-world markets.

### 3.2.2 CONTRACT CALLER FEE MODEL

**Contract Caller:** Any user who calls all contracts within the Ecosystem (ecoLib) is responsible for the transaction fees incurred by that user.

The fee is "whoever invokes the smart contract, that is, whoever pays the network service fee (Gas fee)". This is a common payment method in the blockchain world today, and it is undoubtedly of universal value in decentralized business scenarios, so it is continued in the IBAX network.

### 3.2.3 CONTRACT BINDER FEE MODEL

**Contract Binder:** The transaction fees incurred by all users invoking a contract within the Ecosystem (ecoLib) are paid for by the contract binder's wallet in a flat rate.

The fee method for the ecological library, the creator of the application to specify a wallet for the application of all invocation of the contract (Gas fee) expenses, the use of the application of all users do not have to pay the Gas fee, and do not have to hold (hold) the IBAX network of the base token IBXC. this by the developer of the application to specify the wallet to bear the cost of the way, to the application of the end This way, the program developer designates the wallet to bear the cost, which brings great convenience to the end user of the application, reduces the threshold of use, and also allows its application to be rapidly promoted.

*Note: It should be noted that when the IBXC of this bound account is not enough to cover the cost of calling the contract, its application will not work.*3.2.3 Contract Binder Fee Model

### 3.2.4 ECOBANK CREATOR FEE MODEL

**Ecosystem Creator:** All transaction fees incurred by users invoking all contracts within the ecosystem (ecoLib) are paid for by the Ecosystem creator's wallet in a flat rate.

We encourage users to create their own ecology on the IBAX network, so any user can create an ecoLib. The ecosystem creator has all the characteristics of a normal user,

including the account-wallet address on the IBAX network. When you create an Ecosystem on the IBAX network, you also become the creator of that Ecosystem and have the appropriate permissions for that Ecosystem.

In this fee approach, the cost of the application is borne entirely by the eco-library creator/developer, in line with the "*Contract Binder fee model*".

### 3.2.5 ECO-EXCLUSIVE WALLET FEE MODEL

**Eco-exclusive Wallet:** All transaction fees incurred by users invoking all contracts within this Ecosystem (ecoLib) are paid uniformly by the exclusive wallet set up by the current eco.

Let's imagine a scenario: in a community-run Eco-bank, its applications are developed by multiple community member developers, and in order to quickly promote the Eco-bank's applications and lower the user's threshold, it is necessary to use a method similar to the "contract-binder fee model". However, if the "contract-binder fee model" is used, the wallet address is a conventional public-private key, and even if it is a "multi-signature" wallet, it may artificially cause the loss or theft of assets in the wallet and make the Eco-bank environment collapse.

To avoid this, the IBAX network has created a pioneering "Eco Wallet" where if another wallet address transfers to the "Eco Wallet", its assets will be locked into the IBAX network and used to pay for the application's Gas fees.

The "eco-exclusive wallet" makes it less likely that fraudulent incidents will occur, ensuring the normal operation of the Eco-bank and protecting the rights of users.

The Defi and NFT application environments created using the Eco-Proprietary Wallet will eliminate runaways and asset theft, allowing users to focus on increased liquidity and trading of rare assets.

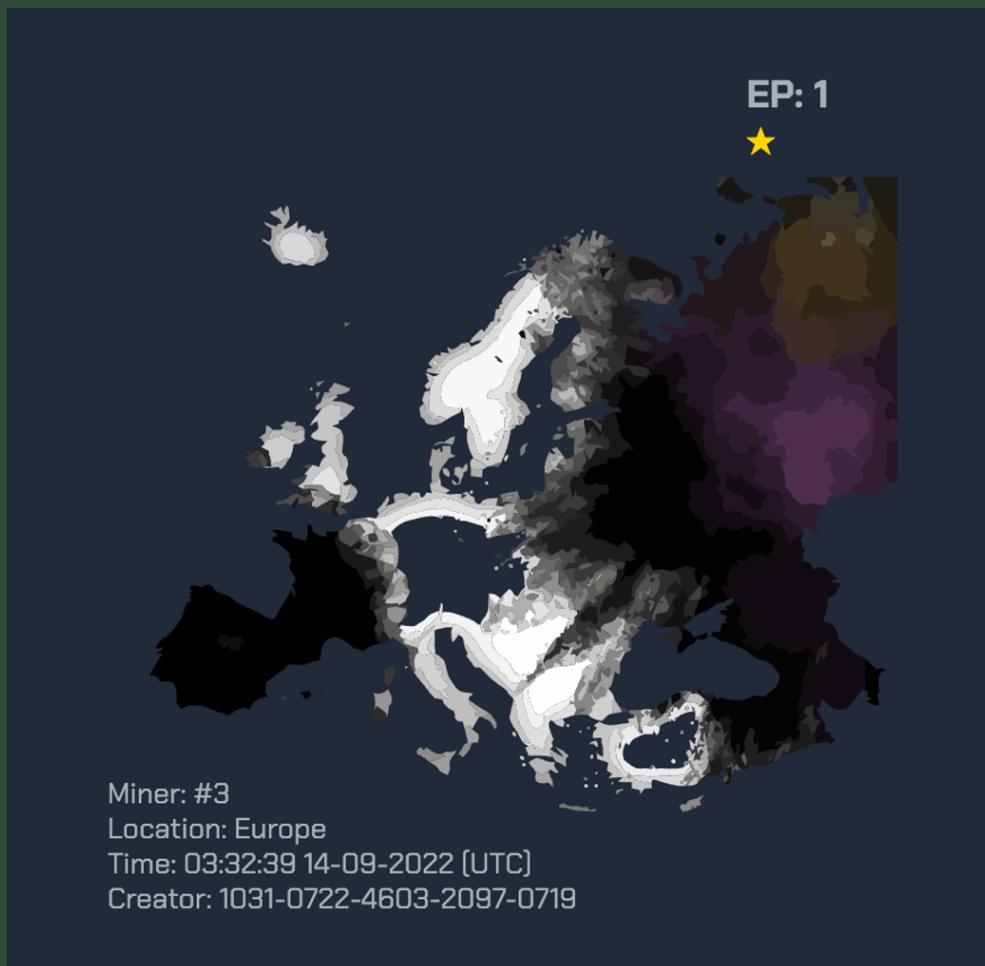
*The priority of all the above payment methods is "Contract Binding Wallet > Eco Wallet Binding > Contract Call Wallet". According to the above settings, eco-operators, or eco-application (DApp) development teams can set different and combinable payment scenarios for their own business, meeting the orderly integration of the crypto world with the real world.*

## 3.4 NFT MINER REWARDS

IBAX public network innovative to create a meta-universe world, dedicated to mapping the real world to the meta-universe world, and beyond the real-world link nodes, breaking the real-world space limitations, IBAX will create a better future for humanity.

We believe that no matter which blockchain network, NFT should not be just a picture, the current collected NFT static income is unstable, if giving NFT interest will bring long-term development for the meta-universe, then NFT should be given holding interest and growth interest.

In order to maintain the long-term development of the meta-universe in the IBAX network and to ensure a stable and secure environment from malicious attackers during the NFT minting process, we therefore designed the block reward of tokens. Each new IBAX network member can create an NFT miner, which will randomly generate a map based on the current user's geographic location and labeled with relevant attributes, such as minters, minting time, and arithmetic value. Each member of the metaverse who completes the mining pledge of the NFT miner has the right to compete for block rewards, and this right is equal and fair. The act of pledging will gain holding revenue, which is related to the properties of the NFTs held.



Sustainable growth of NFT miners will generate higher scarcity, in the IBAX network can use different attributes of NFT miners to synthesize a brand new NFT miner. Newly synthesized NFT miners have a chance to gain higher attributes, become rarer, and have a higher chance to win block rewards. high attributes of NFT miners equate to high equity.

The NFT miners in the IBAX network have beautiful pictures, each with different attributes, but most importantly, the source code of all the NFT miners' pictures exists on the IBAX network itself, not on other Web 2.0 networks, which means that no one can deprive the owner of the original data.

NFT miners are part of the economic model in the IBAX network, but the way its technology is implemented brings new business implementation models to network users. the IBAX public network supports multiple types of NFTs, in addition to JPG, PNG, JPEG image format NFTs, and even SVG motion picture NFTs. as mentioned above, unlike other chains' NFTs, the IBAX NFT is real with the IBAX public network, the chain NFT can be accessed directly through the address of any node.

The metaverse is capable of realizing real and imagined ecological structures. As the IBAX metaverse grows and the number of ecological partners increases, more ecological partners will also have their own unique user ecology and economic models. At this point, the initial creation of NFT in the meta-universe, based on the joint prosperity of the ecology, will not only receive the rewards of the meta-universe, but also various rewards of the joint ecology with economic models. For the act of creating a more multiverse value, IBAX will win a broader, more unknown, and surprising harvest for ecological creators and meta-universe participants!

## 3.5 MINT NODE REWARD

The application data in the metaverse is stored on the IBAX network in the form of blocks. To ensure decentralized storage of data and distributed sources of data, the Mint Node (Mint Node) provides data storage services and data traffic carriers for the metaverse of the IBAX network, so the incentive nature of the metaverse NFT miner and the Mint Node (Mint Node) is the same, but their functions and value are fundamentally different.

In order to pay token holders who, choose to secure the network using Mint and Stake, the network is designed to have a constant rate of new token issuance. These new tokens are paid by the network in an on-chain programmed manner to accounts that protect the network and meet the payment conditions, which include Valid Address, Mint Power, Stake Amount, Stake Period, and effective usage traffic, for receiving the new tokens. The Rewards obtained are proportional to the above conditions they control.

For the Mint Node, read [Section 4.1.1.4 Mint Node](#).

## 3.6 SYSTEM COMPONENTS

This section describes the key system components of the IBAX public network, and some notes on how they interact.

Some basic element concepts.

Each IBXC has two attributes, namely token value and token equity. When the IBXC is in circulation, it reflects the token value; when it is time to exercise the token interest, the negotiable IBXC is locked in the IBAX network and becomes the credential to exercise the interest.

**Ballo:** Each negotiable IBXC is an inactivated ballot. When voting for a candidate honor node, the participating IBXCs are locked in the IBAX network and become non-negotiable activated ballots. Voters may withdraw their votes at a specified time to become a circulating IBXC.

**Delegation:** Each negotiable IBXC can be delegated to other account addresses to exercise voting rights on their behalf. When delegating the IBXCs that need to be used to other account addresses, their delegated number of IBXCs will be locked in the IBAX network and can be withdrawn at a specified time to become negotiable IBXCs.

**Payment in Lieu:** After the Candidate Honor Node satisfies the ballot and base pledge fee, it can make a payment in lieu of the pledge through a third-party account address to complete the full amount of the pledge. The IBXC of the third-party account will be locked in the IBAX system and the pledge can be withdrawn at a specified time.

### 3.6.1 HONOR NODES

Honor Nodes are the most important part of the IBAX public network, responsible for packing blocks across the IBAX network and receiving packing rewards. We use a reputation mechanism and implement it through a multi-dimensional technology that effectively reduces the impact of faulty nodes, hence the name "Honor Node". Honor Node determines and filters the processing results from one or more processing nodes, and needs to be performed by an enterprise merchant or service organization with specialized computing capabilities, using high-performance computers or other cost-effective computing resources, such as globally distributed computing power. Essentially, the same data processing task would be sent to multiple data processing nodes for 'honor nodes' to vote on to determine a satisfactory output. While this will result in data or computational redundancy, the accuracy of the final result can be highly protected.

Candidate Honor Nodes that receive the top 101 public votes are eligible to become Honor Nodes. If the Total Amount of Staking (TAS) does not reach 1,000,000 IBXC, the selected Honor Node can make up the remaining 900,000 IBXC by itself or have a third-

party account address pay for it. After meeting the Total Amount of Staking, it becomes an Honor Node (Honor Node).

Anyone can become an Honor Node (Honor Node), in the case of enjoying the benefits of block packaging, but also directly involved in the governance of the IBAX public network. Under the DAO governance concept, all Honor Nodes (Honor Node) are generated through public voting and are exercising governance authority on behalf of all network members.

In order to better allow all network members to vote to produce Honor Nodes (Honor Nodes) that contribute positively to the IBAX public network, for this reason the IBAX public network counts the contribution of Honor Nodes (Honor Nodes) in the network in real time. Therefore, Honor Nodes with stable network will get more packing power.

Honor Nodes communicate with each other through TCP/IP network protocol to reach network consensus and obtain network status between each other. Honor Nodes with network abnormalities or severe network delays will not be eligible for packaging.

### **3.6.2 CANDIDATE HONOR NODES**

The DAO governance concept is the foundation of the IBAX public network, and any eco-guardian node can apply to become a Candidate Honor Node (CUN).

Requirements for applying to be a candidate honorary node.

- I. Qualified ecological guardian nodes.
- II. Completion of node information for review by all network members.
- III. Pledge of 100,000 IBXC.

After applying to become a candidate Honor Node, you can accept the votes of all network members, and the top 101 who get the votes will become Honor Node.

Withdrawal from Candidate Honor Node (CON) is real-time and threshold-free. However, to avoid affecting the stability of the network and the public's motivation to vote, the IBXCs currently in pledge need to be released after 1 month and can be collected at that time. Of course, you can still apply to become a Candidate Honor Node at any time.

### **3.6.3 GUARDIAN NODES**

As the witness of eco-data and the store of eco-content, the eco-guardian node takes the initiative to request synchronization of eco-data in the IBAX network.

Guardian Nodes are almost zero threshold and any network can become a Guardian Node.

The existence of eco-guardian nodes (Guardian Nodes) provides on-chain eco-developers (DApps) with friendly on-chain data support. You can build an eco-guardian node (Guardian Nodes) at almost zero cost, giving you timely access to the on-chain block data. This approach not only reduces the cost for developers, but also provides more innovative support for developers while ensuring the authenticity of on-chain data.

Compared with the data node threshold of other chains, the friendliness and low-cost advantages of Eco Guardian Nodes (Guardian Nodes) are self-evident. We also provide a rich on-chain API data access interface; developers can more easily access to the data content in the ecological Guardian Nodes (Guardian Nodes). API details can be found at: [www.ibax.io](http://www.ibax.io)

Guardian Nodes can apply to become "Candidate Honor Node" if they meet the hardware conditions and network synchronization, and can be promoted to "Honor Node" if they get enough votes and meet the pledge. "Honor Node".

### **3.6.4 MINT NODE**

A Mint Node is a node that makes "Mint New Coins" in the IBAX network and receives a network reward. It is important to note that "Mint Coin" needs to be done at the same time as "Stake".

The mint node not only generates new IBXC tokens, but also "pledges" IBXC tokens during the "minting" process, which greatly enhances the liquidity of IBXC tokens and creates a better economic environment for the IBAX network. At the same time, the operation of the mint node makes the cost of attacking the network increase proportionally to the total value of IBXC tokens. According to the design of this mechanism of IBAX, it makes the possibility of attack and harm infinitely close to zero, which greatly enhances the security of IBAX network.

At the same time, the biggest role of mint nodes is to provide stable and continuous security for the IBAX meta-universe. As described in "Minting Considerations" in Section 3.2 of this paper, mint nodes are distributed globally and exist independently as distributed servers themselves, and provide decentralized services to various Ecosystems. The mint nodes store the running code of the metaverse (e.g., a large game) and verify it with the metaverse assets in the IBAX network to achieve a truly decentralized GameFi operation. Even if the game operator no longer provides the service, the game itself running on the minting node is still providing the service, making the game assets have long-lasting value.

## 3.7 IBAX COIN HOLDER TYPES

This section describes the seven key components of a token holder, the relationship between them, and the number of IBAX tokens granted to each component.

PRIVATE (private party), PUBLIC (public party), IBAX Foundation (foundation), ECO-PARTNERS (ecosystem partners), IBAX TEAM (founding team), NFT mining and MINT NODES (mint nodes) form the seven key groups of intended initial token holders on the IBAX public network.

### MINT NODES

- Mint Nodes are defined as users who mint tokens by running Mint Nodes and pledging (STAKE), i.e., by "mining". This means that during the two years after the IBAXPN-a network is launched, the effective IBXC circulation will be significantly reduced.

### NFT Miner

- NFT mining is an IBXC distribution mechanism open to all IBAX account addresses, each account address can receive a free NFT miner, participate in mining by way of collateral, there is a certain chance to get IBXC token rewards, the odds and the NFT miner's arithmetic power related.

### PRIVATE

- Private Placement is defined as a specific company, team or individual with significant influence in the industry to whom the Foundation has directed a certain amount of IBXC holders at an internal price.

### ECO-PARTNERS

- Ecosystem partners are defined as any institution, organization or individual that is based on the IBAX public network for ecological development and operation, providing products or services for the whole ecology or a single ecology, and involved in securing the IBAX network.

*For more information about the Foundation, please see the official website for updates.*

### 3.6.1 THE IBAX FOUNDATION GRANT

The IBAX Foundation will promote the IBAX public network and help manage the IBAX community and ecosystem. the IBAX Foundation is responsible for managing two token distributions: the Network Security Distribution and the Foundation Distribution. Each of these distributions serves a different purpose. The IBAX Foundation will promote the IBAX public network and help manage the IBAX community and ecosystem. the IBAX Foundation is responsible for managing two token distributions: the Network Security Distribution and the Foundation Distribution. Each of these distributions serves a different purpose.

Distribution Plan	Objective
Network Security	The first IBAX staking token used to protect the IBAX public network.
IBAX Foundation	To support the long-term growth of the Foundation's technology and ecosystem.

\* For more detailed information on the token fundraising and utilization plan, please refer to the section on Economic Distribution [3.2.5 Token Distribution](#).

Details of the Foundation Staking program and the Network Subsidy program are described above. Tokens distributed by the Foundation are allocated to the IBAX Foundation for the express purpose of advancing the goals of the IBAX Foundation. Once the network is launched, these goals will be guided through community engagement and network governance.

In order for a network of this nature to be successful, companies, developers and consumers must all accept the rule. Acceptance requires dedication, hard work, evangelism and a careful balance of interests on all sides.

While this list is by no means exhaustive, the following is a summary of the contributions that the IBAX Foundation will authorize to the network and community.

#### ① Technology Development

- Core network protocol development
- Open Source Support
- Crisis Management

#### ② IBAX Community Development

- Developers Conference
- Developer Meetups
- HackathonV

### ③ Market Development

- PR/announcements/events
- Mortgagee Relationship
- Mint Node Relationships
- Public Education

# 4. OVERALL ARCHITECTURE

## 4.1 IBAX PUBLIC NETWORK

### 4.1.1 NETWORK PLATFORM ARCHITECTURE

We define IBAX public network as a kind of infrastructure, based on IBAX public network can implement all the applications of traditional centralized system, traditional blockchain system, IBAX network has the UTXO structure of Bitcoin and similar to the Account structure of Ether series, so that IBAX public network can handle complex business logic, but also can use fast UTXO transfer service. The IBAX network is therefore the underlying blockchain framework built in the spirit of innovation to meet the business value of.

- ① **Honor Node:** responsible for data distribution and packaging validation.
- ② **Candidate Honor Node:** Candidate for the honor node.
- ③ **Guardian Node:** responsible for the full amount of data synchronization, and give the ecological application side data fast call.
- ④ **Mint Node:** responsible for distributed storage, i-Files file storage, and can assume the function of distributed application server.
- ⑤ **Sub Node:** Only synchronize the data related to its own physical ecology, built with the concept of side chain.
- ⑥ **CLB:** independent of the IBAX network cross-book communication node, as the IBAX Network Oracle (IBAX Network Oracle) exists, that is, with the same data structure as the IBAX system to complete the in-chain data interaction, but also as a port for off-chain data requests, in the witness of the Consensus Mechanism to achieve the in-chain and off-chain The Consensus Mechanism can also be used as a port for off-chain data requests. It also allows P2P transmission of encrypted data to CLBs of different ecologies as needed, realizing the interaction of hidden data and meeting the mandatory compliance requirements of different countries for network security. This feature and function of her is simply sexy, so that the IBAX OS platform really completes the off-chain environment interface, cross-chain will no longer be a problem.
- ⑦ **IBAX Exclusive Smart Contract:** independent of the IBAX network cross-book communication node, as the IBAX Network Oracle (IBAX Network Oracle) exists, that is, with the same data structure as the IBAX system to complete the in-chain data interaction, but also as a port for off-chain data requests, in the witness of the Consensus Mechanism to achieve the in-chain and off-chain The Consensus Mechanism can also be used as a port for off-chain data requests. It also allows

P2P transmission of encrypted data to CLBs of different ecologies as needed, realizing the interaction of hidden data and meeting the mandatory compliance requirements of different countries for network security. This feature and function of her is simply sexy, so that the IBAX OS platform really completes the off-chain environment interface, cross-chain will no longer be a problem.

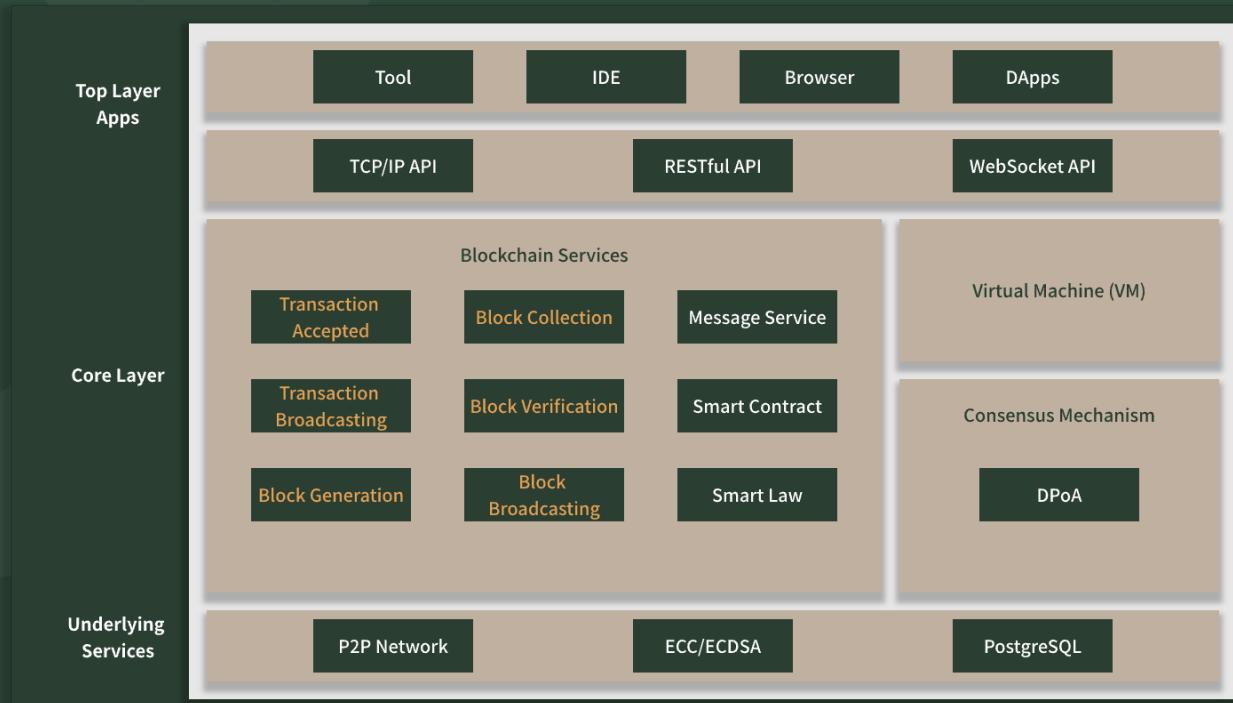
- ⑧ **Database:** safe and efficient data storage, object-oriented design of the relational database, while the development team in continuous development, the "time series database" compatible with the IBAX network, then will theoretically achieve a million / second of complex things business processing.
- ⑨ **IBAX Contract Virtual Machine (IVM):** IBAX public network contract virtual machine written based on Golang language, with stable performance and efficient operation. Smart contracts running in the IBAX public network need to be parsed by the contract virtual machine to complete.

These functions mentioned above together build the IBAX operating system platform, each setting has poured countless efforts of engineers, our love of IBAX network is like its own children in general, both to make him fully functional to adapt to the social environment, but also not over-nourished into a giant baby cannot take care of themselves. Imagine our growth process, as long as there is a good growth environment (basic components) coupled with excellent learning ability (scalability), it can become even greater.

In the design of the IBAX network our chief designer forcefully removed many important but not necessary features, because we do not want to make IBAX into a giant baby, as long as the basic components of the operating system platform, coupled with the architecture comes with scalability can make IBAX powerful and excellent.

#### 4.1.1.1 HONOR NODE

Honor Node is the most important component of IBAX public network, he is responsible for transaction execution and verification, collecting transaction information from other nodes to add to the transaction queue, and verifying whether the newly generated blocks are correct and valid through the confirmation mechanism. Usually he has three states: when packing, when not packing, and when campaigning. Honor Node is the most important component of IBAX public network, he is responsible for transaction execution and verification, collecting transaction information from other nodes to add to the transaction queue, and verifying whether the newly generated blocks are correct and valid through the confirmation mechanism. Usually he has three states: when packing, when not packing, and when campaigning.



The packaged state Honor Node is the highest performance, fetching the pending transaction request from the transaction queue, verifying that the signature is valid, verifying the correctness of the transaction, such as whether the transfer amount is sufficient and whether it has transaction operation privileges, and executing the transaction accurately. Both correct and incorrect transaction transactions (incorrect transactions will be rolled back) will be written to the block, and incorrect transactions will be penalized with a GAS fee. Executed transactions are communicated to other Honor Nodes by broadcast along with the block.

The Honor Node in the unpacked state is mainly responsible for block verification to confirm that the transactions within the block generated by the packaged node are executed correctly, and if there are exceptions, exception handling will be triggered and the IBAX network will roll back the block and re-verify it.

The Honor Node in the campaign state will actively communicate with all Honor Nodes via TCP/IP protocol every minute, and the Honor Node that completes the communication signs the confirmation of this communication, which is considered a valid communication. Each Honor Node broadcasts its successful communication signature data to all Honor Nodes, so that it obtains the communication result that is uniformly recognized by the whole network.

$$N = \lceil \sqrt{H} \rceil$$

*N:* number of valid *blocks*, *H:* total number of Honor Nodes.

Honor Node's campaign packaging consensus. Honor Node with more than 50% effective communication rate will get the packing right. To ensure fairness, the campaign packing consensus also adds the case of excluding nodes from continuous packing: even if a Honor Node has a communication speed and effective communication rate that exceeds that of the whole network, it cannot get the packing right within 'N' blocks.

This mechanism avoids the possibility of Honor Node monopolizing the packing rights. The campaign packaging consensus encourages Honor Node to use efficient hardware devices and stable network services because higher effective communication rates will gain more packaging rights.

Another case special case, if: the number of Honor Nodes in the whole network is less than (including) 3. At this time, the campaign packing consensus will be abandoned and the Honor Node rotation packing will be used. Although this is unlikely to happen, the IBAX public network has envisioned all abnormal scenarios in order to ensure the safe operation of the blockchain network.

#### **4.1.1.2 CANDIDATE HONOR NODE**

Candidate Honor Node is an advanced node of Guardian Node. Compared with Guardian Node, Candidate Honor Node can be promoted to become an honor node when it meets the conditions of pledge and public vote, so Candidate Honor Node has Guardian Node's full data, i.e., it owns the full amount of block data on the chain.

Candidate Honor Node assumes the public voting function in DAO governance, and each Candidate Honor Node is a valid Honor Node campaigner.

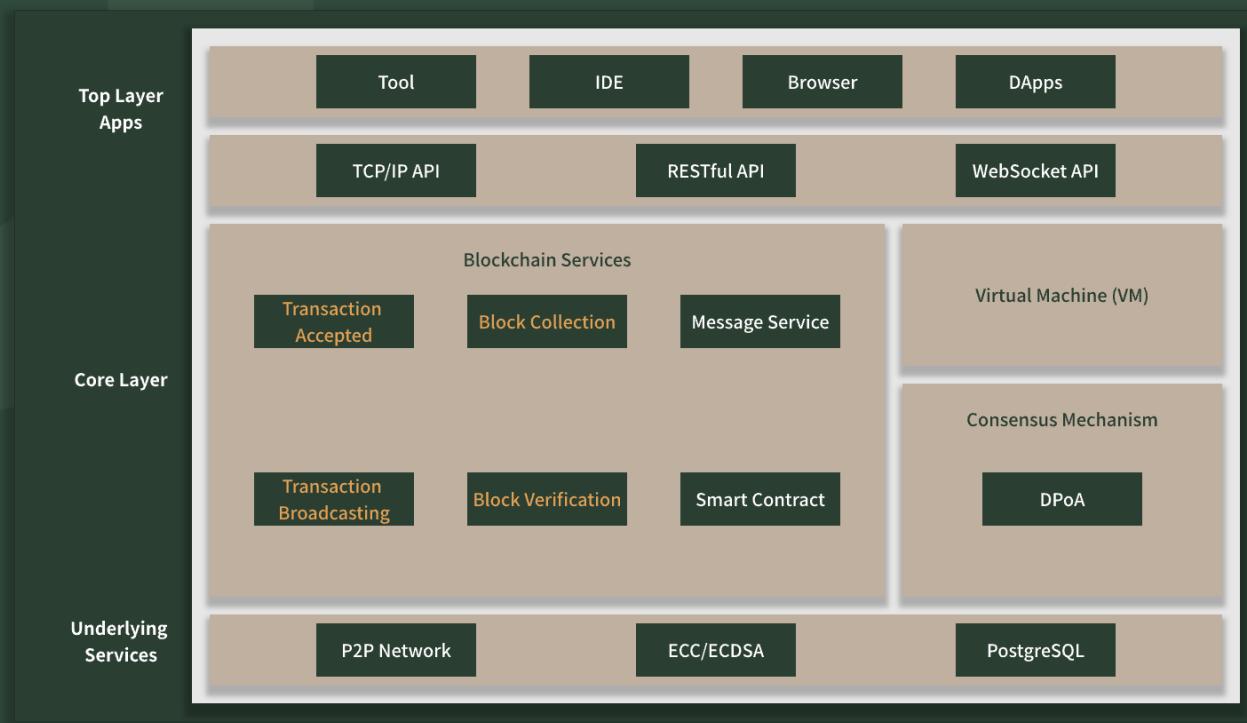
The IBAX Public Network will count the number of votes cast by the public for Candidate Honor Node in real time and give it a ranking. The top 101 Candidate Honor Nodes will receive Honor Node status, enjoy the benefits of Honor Node and exercise governance of the IBAX Public Network on behalf of the voting public.

#### **4.1.1.3 GUARDIAN NODE**

Guardian Node exists as a data storage and business witness, with the ability to actively access block information. guardian Node is an important data guardian in the IBAX network, even if all Honor Node data is lost (which will never happen), as long as there is still a Guardian Node's data exists IBAX network can also be quickly restored to normal.

The block data stored in the Guardian Node is always consistent with the main network, and any user of the IBAX public network can create a Guardian Node. Node.

Guardian Node provides easy and fast access to on-chain data for eco-applications and eco-developers, which is why it is called Guardian Node.



#### 4.1.1.4 MINT NODE

Mint Node (Mint Node) provides data storage and peer-to-peer (P2P) communication nodes for the IBAX network.

In order to meet the requirements of data storage and traffic transmission of IBAX network, mint nodes need to have good hardware equipment and stable network services. Therefore, the important factors for considering mint nodes are: CPU, RAM, HDD. IBAX network completes a comprehensive score through the performance of hardware devices of mint nodes, and gets the corresponding arithmetic power according to the score, which we call 'mint arithmetic power'.

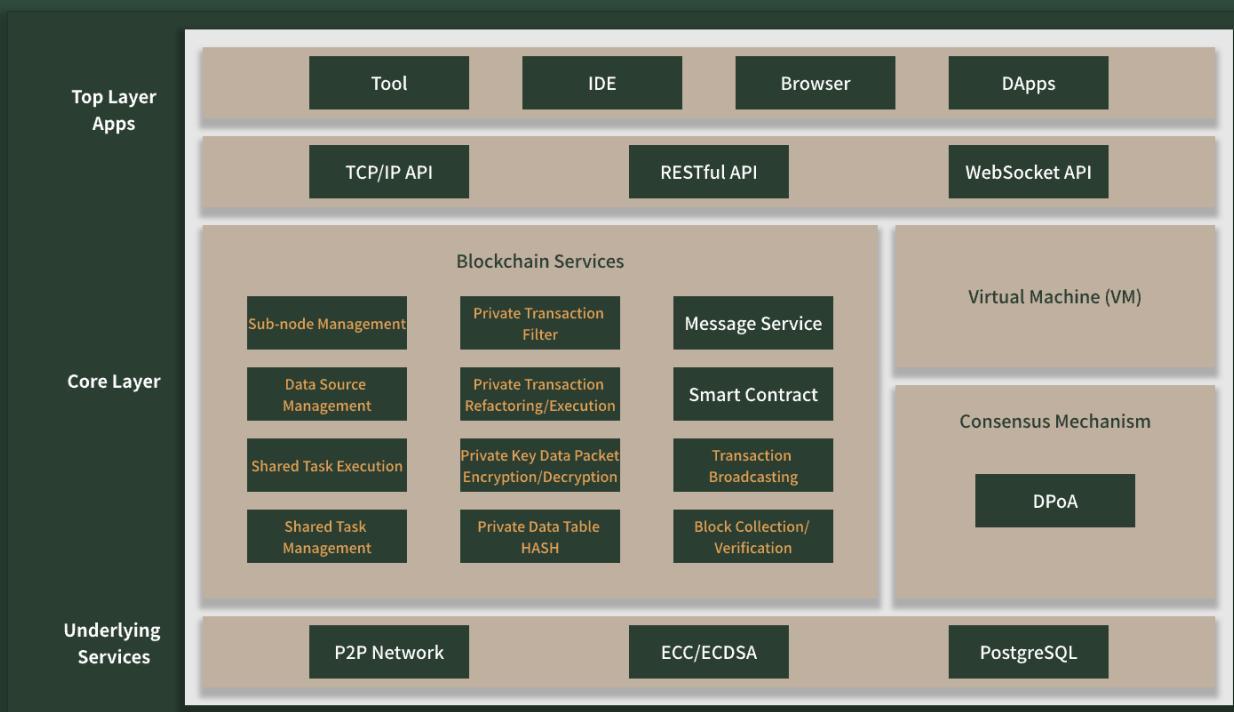
Factors affecting the mint arithmetic are also related to the network services provided by the mint nodes. Ecological applications (Ecosystem) running in the IBAX network obtain stored data on the chain from neighboring mint nodes via peer-to-peer transfer protocol (P2P), giving the mint nodes additional arithmetic depending on the amount of traffic used, an arithmetic we call 'traffic arithmetic'.

The mint nodes have the characteristics of maintaining the stability of the IBAX network, improving the decentralized distributed storage of IBAX, and also providing network

services for ecological applications, so the IBAX network gives the mint nodes the corresponding 'mint' rewards.

The mint node not only generates new IBXC tokens, but also "pledges" IBXC tokens during the "minting" process, which greatly enhances the liquidity of IBXC tokens and creates a better economic environment for the IBAX network. At the same time, the operation of the mint node makes the cost of attacking the network increase proportionally to the total value of IBXC tokens. According to the design of this mechanism of IBAX, it makes the possibility of attack and harm infinitely close to zero, which greatly enhances the security of IBAX network.

A Mint Node that secures the network and can mint new IBXC tokens gives token holders the option to pledge a portion of their IBXC liquidity balance to the Mint Node to generate new IBXC token proceeds (Mint & Stake Emission Rewards). The purpose of Mint and Stake is to increase the cost of attacking the network in proportion to the total value of IBXC tokens.



#### 4.1.1.5 SUB NODE

The Sub Node in the IBAX network is the first of its kind in the entire blockchain world. It only keeps the data of transactions related to its own ecology (application), while the full amount of data is carried by Honor Node, Guardian Node and Mint Node. In addition, Sub Node can also interact with "private data" to ensure the privacy, security and flexibility of transactions.

In some traditional applications, there are cases where the storage is limited to business data related to itself. There is no blockchain among many blockchain projects that can support the creator not to keep the data of other ecologies (applications) (or no need to keep the full amount).

Sub Node can only keep the data of transactions related to its own ecology (application), and Sub Node can also execute its own independent ecology (application) separately from other node networks, so we also call Sub Node - side chain.

#### 4.1.1.6 CLB

The cross-book communication node (CLB for short) in the IBAX network is a node independent of the IBAX network, but at the same time has the function of a "prophecy machine" (Oracle). In the words of the architect to explain: I simply love this feature; his existence is like opening a door to the world for the IBAX network.

CLB runs as an independent node without affecting the performance of the master node, allowing flexibility to configure CLB performance and deployment according to business requirements. In a complete CLB application with independent smart contracts, operation interface and database tables, etc. The operation interface can be an APP written based on WEAVER or a front-end interface implemented directly through API.

CLB is designed to meet the cross-chain, through CLB comes with data reading function and smart contract asset locking, conversion, so that external assets into assets within the IBAX ecosystem. In the process of use we were surprised to find that CLB can do much more than that, CLB can not only get data from external systems through the contract, but also the data can be processed and formatted to be used by the IBAX network. For example, weather data, external authentication results, and even access to Bloomberg (Bloomberg) or Wikipedia (Wikipedia) data for use on the chain.

We also consider that the smart contract in CLB can change the behavior of the trigger element due to human reasons, so IBAX engineers combined the smart contract on the chain and the smart contract in CLB to implement the function of "verification binding", when the smart contract in CLB and the smart contract on the chain for verification do not match, the CLB will not be executed when the smart contract in CLB and the smart contract on the chain for verification do not match, which ensures and enhances the user's trust in the ecology running CLB.

CLB-based applications give us a lot of room for imagination.

With so many data applications and so many ways to access data, it's simply more exciting than achieving cross-chain.

## 4.1.1.7 DATABASE

The IBAX network uses a PGSQL database as the underlying data storage layer, which is completely open to the public. Each node has its own and network-wide synchronization of the database, thus forming a large distributed database network. The IBAX network uses object-oriented design thinking to achieve data pre-compilation through the PGSQL relational database, effectively improving data processing efficiency.

If you are a technical person, you may be interested in the following content, if not you can ignore this section.

- ① Table names without numeric prefixes are network platform (IBAX Network Basic) permission tables.
- ② Tables with numeric prefixes in the table name are ecological (Ecosystem) permission tables.

## 4.1.1.8 IBAX SMART CONTRACTS

Smart contracts are extremely important to the IBAX network, and similar to the functionality of smart contracts in other chains, the advantages of smart contracts to handle logic and transactions on the chain are obvious. Smart contracts in the IBAX network are designed with unique innovations and differentiators, and in order to improve the execution efficiency of the contract virtual machine, we have designed a new smart contract language that we call "Needle".

Needle supports multiple layers of nested contracts, where multiple contracts can be run inside a single contract and the values of the parameters inside the contract can be fetched. This implementation is similar to the Golang language approach, allowing developers to write contracts using an object-oriented approach.

In some special business situations, such as block height and logic satisfaction triggered by "delayed contracts", this type of contract allows more accurate business judgment and improves the ability to execute business in unknown situations.

The contracts in IBAX are omnipotent and can meet almost any of your needs. Therefore, we have made strict limits regarding the security and permission control of the contract. Smart contract permissions are specified by the developer, and only members within this role have permission to use the contract by adding roles to the smart contract that they are authorized to invoke.

You also need to know that contracts are open permissions by default, so to implement a permission contract, you need to specify contract permissions.

## 4.1.2 BUSINESS ARCHITECTUREV

### 4.1.2.1 ECOSYSTEM (ECOLIB)

It is very easy to create an Ecosystem in the IBAX web system platform, and the average user can quickly create an Ecosystem of their own. We have integrated and developed an ecology creation application that allows users to create their own ecology (Ecosystem) with a "one-click" process.

When creating an ecology, you can set ecological parameters and rules, designate an account as an ecological manager, set ecological fee model, and ecological economic model. Most importantly, we are trying to make the DpoA consensus better applied within the ecology, the ecology creator can set up the ecology's DpoA consensus by writing their own contracts or importing them.

We are very good at supporting eco-issuing 'eco-passes', which can be done quickly by simply importing contract templates.

Due to the difference in consensus and management authority, the ecology can be divided into decentralized and centralized ecologies. There is no superior or inferior type of ecology, conforming is the best. What if it conforms now and does not conform in the future? In the IBAX network system platform is fully supported to modify the ecological parameters, even if it is the ecological Consensus Mechanism, ecological pass, governance method, etc. All this is left to the ecological managers or ecological governance committees (depending on the ecological type) to be autonomous.

In the IBAX web system platform, ecology has complete data control with independent database tables, database field design and access rights. When designing data permissions, we support triggering when data fields satisfy logical expressions. This design brings imagination to listening, logical satisfaction, time triggering, specific conditions triggering and other special business.

It is possible to write your own contracts in the ecology without any restrictions. For a description of smart contracts see [4.1.1.8 Proprietary Smart Contracts](#).

There can be multiple applications (DAPPs) within an ecology, each with separate application parameters. An ecology is like a platform on which you can accomplish anything you want to achieve.

To better support eco-developers, we provide an editorial management and development tool WEAVER (IDE), whose existence will greatly reduce eco-development costs and maintenance management costs, see [4.2.1 WEAVER Overview](#) for details.

## 4.1.2.2 ECOGROUPS

consisting of multiple Ecosystems, which we call ecoGroup.

The chain communication we want to achieve is divided into in-chain interoperability and out-of-chain interoperability. Outside the IBAX network system platform, we have CLB to support external data communication. Inside the IBAX network system platform, we have ecoGroup to achieve inter-ecological authorization and ecological data interoperability.

In the traditional Internet, the cost of acquiring users and traffic is tremendous, while in the IBAX network, these costs will be minimized. ecoGroup is used to solve the problem of user interoperability and traffic interoperability.

IBAX network can be seen as a total user pool, each ecology is a small user pool, through the form of ecological authorization to form ecological clusters, just as a lake (ecology) through the river (authorization) connected, and eventually become an ecological network, the formation of productive ecological communities.

The emergence of ecoGroup achieves to let technology return to technology and traffic return to traffic, solving the operational problems of R&D teams and bringing more rich and wonderful interesting applications to users.

## 4.2 DEVELOPMENT PLATFORM (IDE)

### 4.2.1 WEAVER OVERVIEW

The IBAX network provides a complete visual development tool: WEAVER for ecological (sidechain) and application developers for DApp development.

IBAX Network has created its own language: the language for logic processing and contract writing is called "Needle", and the language for page and layout functions is "Logicor", both of which are used in the "WEAVER" client. WEAVER" client, which allows users to develop and then package the product for use by customers.

Not only that, WEAVER client can also perform ecological management, node management and other related functions.

In addition, WEAVER has a BaaS function, which allows you to download and import relevant applications from the DApp Store of the IBAX network into a "physical ecosystem" (sidechain) that you create yourself and manage them.

Of course, the IBAX network's built-in ecological Basic DApp can also be managed via WEAVER.

## 4.2.2 WEAVER MAIN FUNCTIONS

- ※ Provision of user pages.
- ※ Providing an IDE for application development. Storing the public key of the user account and performing authorization.
- ※ Requesting database API data from the application page and displaying the application page to the user.
- ※ Send transactions to the server via the REST API.

To facilitate the automatic creation of transactions by user actions, when an application developer executes a contract from the IDE, WEAVER converts that action into a transaction.

## 4.2.3 WEAVER INTERFACE AND STRUCTURE

Selecting the node to be connected, the user can start a node locally for connection, or connect test network nodes, IBAX public network nodes, etc.

ID	Name	Nodes	Actions
1	Default Network	1	Connect
1	(Current) IBAX	3	Connect Remove

**Add network**  
Specify connection details and connect to another network not listed there

As with the regular blockchain, accounts can be imported or newly registered.

**Account actions**

**I have a key**

If you are already familiar with IBAX and have a backup of your private key, choose this option to guide you through the process of restoring your account data

[Import existing key](#)

---

**I don't have a key**

If you are new to the system or just want to create a new account, choose this option to generate a new private key and protect it with your password

[Generate new key](#)

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Import system contracts, base contracts and ecological contracts.

**Developer**

Home Admin Developer Editor

Import

Import

Select payload that you want to import

Load

## Create Ecosystem (sidechain).

The screenshot shows the 'Ecosystems catalog' page of the IBAX Platform. On the left, there's a sidebar with links like Profile, Messenger, Notifications, Ecosystem members, Votings, and Ecosystem catalog. The main area has a search bar and a 'Create' button. A modal window titled 'Create' is open, showing a 'Name\*' field with 'Ecosystem demo' entered. Below the name are 'Back' and 'Create' buttons.

## View the existing Eco-bank system (sidechain).

The screenshot shows the 'Ecosystems catalog' page of the IBAX Platform. The sidebar and top navigation are identical to the previous screenshot. The main area displays a table of existing ecosystems. The first row in the table is highlighted. The columns are labeled ID, Ecosystem, Ecosystem type, and Necessity of having an IBXC. The first row shows ID 2, Ecosystem 'Ecosystem demo', Ecosystem type 'Public organization', and 'IBXC is not required' under 'Necessity of having an IBXC'. There is also a small gear icon next to the ecosystem name.

ID	Ecosystem	Ecosystem type	Necessity of having an IBXC
2	Ecosystem demo	Public organization	IBXC is not required

In the "Dashboard" you can view smart contracts, database tables, pages and application parameters of each application "DApp", and in the self-built ecosystem, you can add, edit, etc. The edited history version is kept on the IBAX network.

Contracts			
AddAssignMember	max_fuel_tx		price_exec_substr
AddFoundationMember	max_indexes		price_exec_sys_fuel
AdminCondition	max_tx_block		price_exec_sys_param_int
AppendMenu	max_tx_block_per_user		price_exec_sys_param_string
AppendPage	max_tx_size		price_exec_table_conditions
AppInstall	MembershipAdd		price_exec_unbind_wallet
AssignRolesInstall	MembershipDecide		price_exec_update_lang
BindWallet	MembershipRequest		price_exec_validate_condition
blockchain_url	MetricsUpdate		price_tx_data
BlockMember	NewApplication		price_tx_size_wallet
block_reward	NewAppParam		PrivateRoundCondition
BufferFileUpload	NewBadBlock		ProfileEdit
BufferManager	NewBlock		PublicRoundCondition
CallDelayedContract	NewColumn		ResearchTeamCondition

**WEAVER** is much more powerful than that, and more features are waiting for you to discover!

## 4.3 IBAX CONTRACT VIRTUAL MACHINE (IVM)

### 4.3.1 SOURCE CODE STORAGE AND COMPILED

The IBAX Contract Virtual Machine (IVM) is written in Golang, a language with the advantages of memory safety, garbage collection station (GC), structural morphology and CSP-Style concurrent computation.

IBAX's contract virtual machine is combined with database to give full play to the high storage and high concurrency feature of PGSql database, which updates and saves the contract source code in the database after the contract is created or modified. When executing a contract, the contract source code is compiled into bytecode in the contract virtual machine. The bytecode is not physically stored anywhere, and the contract source code needs to be recompiled each time the contract is executed, this way ensures the security of the contract during execution.

## 4.3.2 ECO-CONTRACT VIRTUAL MACHINE

The contract source code described in the contract table of all ecologies (Ecosystem) in IBAX is compiled into an ecological contract VM in a strict order, and the state of the VM is consistent across all nodes.

When a contract is called, the eco-contract virtual machines are isolated from each other and do not intersect data in any way. The execution of any contract procedure or call to a function occurs in a separately running stack created by each external call.

Each ecosystem can have an ecological contract VM that can be used with the ecological data table within any Honor Node (Honor Node) and does not affect other ecologies (Ecosystem). That is, the ecological contract VM created by each Honor Node is the same, and the result of executing the contract is the same. This multi-threaded execution greatly improves the TPS of IBAX.

## 4.3.3 VIRTUAL MACHINE ARCHITECTURE

The VM structure has the following elements.

- ＊ Block, containing a block structure.
- ＊ ExtCost, which returns the cost of executing an external Golang function.
- ＊ FuncCallsDB, a collection of Golang function names that return the execution cost as the first argument.
- ＊ Extern, a Boolean identifier indicating whether the contract is an external contract. When creating a VM, it is set to true and the invoked contract does not need to be displayed when compiling the code. That is, it allows calling the code of a contract to be determined in the future.
- ＊ Shift Contract, the ID of the first contract in the VM.
- ＊ Logger, the VM's error log output.

For more structure content, please see the technical description document: <https://github.com/IBAX-io/documentation>.

## 5. TECH FEATURES AND ADVANTAGES

### 5.1 TECHNICAL FEATURESV

#### 5.1.1 EXCLUSIVE APPLICATION PROGRAMMING LANGUAGE

The underlying language for smart contracts is written using the native Turing scripting language, compiled to bytecode. The language includes a set of keywords, functions, operators and constructs that can be used to implement data processing algorithms and database operations, and contracts can be called in nested sets with other contracts.

We have named the smart contract language "Needle".

**Principle:** Smart contracts are the basic elements of an application. The user executes a contract on a page, usually as a single action, and the result of the execution includes modifying or adding a record to the database. All data operations of the application form a system of contracts, which interact with each other through the database or functions of the contract content.

The contract is declared using the smart contract keyword, followed by the contract name, and the contents of the contract must be enclosed in curly brackets. The contract structure has three main parts.

- ① *data* - the data section, which declares the variables of the input data, including the variable name and variable type.
- ② *conditions* - the conditional part, which verifies the correctness of the data.
- ③ *action* - The action section, which performs the action of the data manipulation.

#### 5.1.2 SELF-MANAGEABLE DECENTRALIZED, FAIR AND TRANSPARENT (DAO)

IBAX aims to provide a truly self-manageable, decentralized, fair and transparent "decentralized organization" in the marketplace, where we ensure the decentralization of the organization while fully placing the management functions and responsibilities in the hands of the public.

IBAX aims to provide a truly self-manageable, decentralized, fair and transparent "decentralized organization" in the marketplace, where we ensure the decentralization of the organization while fully placing the management functions and responsibilities in the hands of the public.

In each step of voting, public announcement and execution, it is left to the organization participants to manage and vote together. Any decision, the smart contract within the DAO will be automatically executed according to the programmed settings in accordance with the opinion voted out by the organization. After the voting result, no one can interfere with the execution of the contract, and the process is irreversible.

Decentralized DAO allows community members to achieve better autonomy. As long as the voting rules and effective conditions are set, DAO will always be executed according to the common agreement of all.

Building a DAO organization in the IBAX network is simple and easy, just create an ecology, i.e., build a DAO organization.

### **5.1.3 SMART TRANSACTION PROCESSING MECHANISM**

Unlike other blockchain systems where a single execution of a contract leads to business homogeneity, the IBAX network supports a multi-layer contract nesting mechanism. This mechanism allows multiple contracts to form a smart transaction that can handle complex business logic, which contains multiple multi-directional business contracts and multiple business interface functions, and a smart transaction is equivalent to a set of business rules within the system.

Intelligent transactions communicate with each other for processing, making the dull business communication model within the blockchain system broken, and the huge and complex business logic and business requirements become clear and simple to implement within the IBAX network.

### **5.1.4 MULTI-LEVEL ROLE AUTHORITY MANAGEMENT**

The ecology in the IBAX network can set different roles and permissions according to the business, such as setting administrator permissions, visitor permissions, user permissions, and so on. It is also possible to set up different levels of management rights according to different business environments to meet various commercial needs. The same technical kernel carries different role rights, which is sufficient to support complex and changing business scenarios in the market.

There is a clear concept of roles and users in the IBAX network. By giving certain privileges to a role and adding users to this role, all users in this role will have the same privileges.

In addition, administrators can be set up within the same role, and administrators have permission to add or remove users from the role group.

You don't need to worry about the emergence of centralized management due to the existence of roles and permissions, the voting mechanism perfectly avoids this situation.

### **5.1.5 ISOLATED AUTHENTICATION**

Isolated authentication was first introduced for Bitcoin transfers, where Core Concept was used to implement and confirm Bitcoin transfers without touching the Bitcoin network. It was later adopted in various "payment" blockchain projects.

Is the biggest purpose of isolated authentication just to complete "offline payments"?

We have repeatedly stressed that IBAX is a set of blockchain operating system developed according to the reality of the real-world scenario, isolation verification is a very important function, the role of the prevalent with the Internet is not always connected to the local area network environment, such as e-government environment, enterprise internal production management environment.

IBAX is located in large data centers around the world as the authorized Honor Node for validation and packaging, which is responsible for packaging and validation, but also for disaster recovery and anti-tampering. In production environments that are not always connected to the Internet or require a special VPN to connect to the Internet, its Sub Node uses IBAX's built-in database for temporary storage of data to ensure normal production, and automatically synchronizes production data to the Honor Node when the Sub Node is connected to the Internet.

The production environment is sovereign, with the prerequisite that the end-user trusts the Sub Node (e.g., government offices, etc.), and because the internal data is stored by the database and does not require instant packaging and validation by the Honor Node, its concurrent transaction processing speed is not constrained to the network speed, so it can be applied to systems with large data volume interactions.

### **5.1.6 MULTIPLE ENCRYPTION ALGORITHM SUPPORT**

In data transmission, another type of encryption is attached to the mathematical algorithm encryption on top of the node data processing layer.

The encryption algorithm of the chain itself can be changed, and the non-elliptic curve algorithms of multiple countries can be compatible with the adaptation. Provide a variety of encryption algorithms configurable mechanism, support encryption algorithm expansion on demand.

## 5.1.7 ZERO KNOWLEDGE PROOF

IBAX networks provide provers with the ability to convince a verifier that an assertion is correct without providing any useful information to the verifier. A zero-knowledge proof is essentially an agreement involving two or more parties, i.e., a series of steps that both or more parties need to take to accomplish a task. The prover proves and convinces the verifier that he or she knows or has a certain message, but the proof process cannot divulge any information about the proven message to the verifier.

In the IBAX network, we designed two implementations, zero-knowledge proof for transactions and zero-knowledge proof for smart contracts. In all modern blockchain networks driven by smart contracts, only zero-knowledge proof for smart contracts can guarantee the security of data.

## 5.1.8 PRIVACY TRANSACTIONS

An important feature of blockchain is openness, which means that anyone can pull down the data of the whole block from the chain. Although anonymous transactions are used by blockchain projects including Bitcoin, there is still a high probability of discovering both sides of the transaction by analyzing the data address and the related IP. And a significant portion of the transactions are not needed or desired to let others know the details of the transaction, especially the object of the transaction.

A privacy transaction is one in which the information about the parties to the transaction cannot be known through technical means.

## 5.1.9 MULTIPLE SIGNATURES

In the IBAX public network, multiple signatures can be implemented in two ways: regular multi-signatures and contract co-location multi-signatures.

- ① Conventional multi-signature technology is when multiple users sign a digital asset at the same time. It can be simply understood that multiple people have the right to sign and initiate payment for an account. If an address can only be signed and paid by one private key, the expression is 1/1; while the expression of multiple signatures is m/n, which means a total of n private keys can sign an account, and when m addresses are signed, a transaction can be paid. Therefore, m must be less than or equal to n.
- ② The IBAX network not only creates multi-signed wallet addresses, but also allows multiple people to manage a single wallet private key. Because the IBAX network can handle complex business logic, it can also create multiple signature asset stores governed by "roles" that "lock" assets in the IBAX public network and are co-managed by different separate accounts, depending on actual business needs. Set

the percentage of the number of assets to be transferred to achieve a truly consistent "co-mingling of funds" with the banking system.

## 5.2 DATA INTERACTION METHODS

IBAX public network provides 7 different data interaction methods for users to realize their own business logic. The 7 forms of data interaction methods cover all business scenarios including centralized organization and DAO, between DAO and DAO, etc., which can meet various business needs.

### 5.2.1 INTERNAL INTERACTION IN THE SAME ECOSYSTEM

When the main chain interacts with the full amount of data: multiple Sub Nodes can be set up in the ecology, and the full amount of data of the Sub Node is synchronized, similar to the DApp in Ether, but only the full amount of data of the DApp needs to be synchronized, and the data interaction is carried out through the main chain. (Example: commonly used for important data interaction between different systems within enterprises and organizations, especially for finance, depository, risk control, etc.)

Data interaction in the main chain part: Within the ecology, multiple Sub Nodes can be set, and the data of Sub Node has selective synchronization, and data interaction is carried out through the main chain. All data trajectories are fully controlled, fully traceable, and can filter irrelevant ecological data.

Main Chain HASH Full Volume Verification: All Sub Nodes in the ecology get interaction notifications through the main chain block data packets, and then connect to the target Sub Node for off-chain interaction. All request trajectories are fully controlled and traceable, and irrelevant ecological data can be filtered. (Example: commonly used for important data interaction between different systems within enterprises and organizations, especially for ERP, approval, monitoring, etc.)

Main chain HASH partial verification: Multiple Sub Nodes in the ecology selectively obtain interaction notifications through the main chain block data packets for off-chain interaction. All request trajectories are fully controlled and the process is traceable, and irrelevant ecological data can be filtered.

## 5.2.2 INTERNAL INTERACTION OF DIFFERENT ECOSYSTEMS

Main chain HASH full volume verification: Sub Node between multiple ecologies obtains interaction notification through the main chain block data packet, and then connects to the target Sub Node for off-chain interaction. All data trajectories are fully controlled, process traceable, credible and connected, and unrelated ecological data can be filtered. (Example: commonly used for cross-enterprise and inter-organizational system interaction, especially for supply chain, finance, industry, transportation, etc.)

Main chain HASH partial verification: Multiple Sub Nodes between multiple ecologies selectively obtain interaction notifications through main chain block data packets for off-chain interaction. All data trajectories are fully controlled, process traceable, credible and connected, and can filter irrelevant ecological data.

CLB interaction: multiple Sub Nodes interact directly with each other through CLB nodes. Private interaction, the privacy of the interoperability process is absolutely secure and highly efficient.

## 5.2.3 OFF-CHAIN/CROSS-CHAIN DATA INTERACTION

Cross-chain data interaction: IBAX's data interaction is not only limited to node to node interaction between on-chain networks, but also the interaction between on-chain nodes and off-chain systems, or other blockchain systems using CLB, and through CLB's innovative contract verification mechanism, when external systems need to call on-chain contracts to perform on-chain operations, the IBAX public network will be in the execution process and IBAX public network will verify whether the hash of the contract is correct during and after the execution to make sure that the handshake between off-chain and on-chain interaction is trustworthy and secure, which can guarantee that there is no risk of tampering with the contract during the interaction.

## 5.3 DATA PROTECTION AND COMPLIANCE

### 5.3.1 ON-CHAIN PERSONAL INFORMATION STORAGE

According to the data protection policy of the IBAX public network, users are strictly prohibited from storing personal data information of natural persons without encryption and are required to use encryption and anonymization technologies to protect their personal data information. Users can also join the "physical ecosystem" (sidechain) that provides this service, but it is important to note that users need to carefully check the parameters of the smart contract code of the ecosystem and whether encryption and anonymization services have been enabled.

## 5.3.2 NATIONAL PRIVACY DATA PROTECTION COMPLIANCE

According to the EU "General Data Protection Regulation" (General Data Protection Regulation), Japan "Personal Information Protection Act" and other national laws and regulations, the collection, use, processing, transmission and other acts of personal data information of natural persons IBAX has strict constraints on the collection, use, processing, and transmission of personal data of natural persons, and in order to avoid violations by users (including ecological side chain creators), IBAX provides a comprehensive solution.

IBAX provides the ability for users to create CLBs, cross-ledger communication nodes that have the full functionality of a standard physical ecosystem (sidechain), but with data running outside the IBAX master chain and taking on the function of a prophecy machine (Oracle) responsible for the interaction of in-chain and off-chain data.

Users can choose whether the data in the CLB is to be uploaded for encrypted/unencrypted transmission, or whether the transaction summary is recorded on-chain and the data is transmitted off-chain in a peer-to-peer encrypted manner, thereby complying with national regulations on personal data privacy protection.

# 6. IBAX APPLICATION FIELDS AND FUTURE PROSPECTS

## 6.1 DAO OPERATIONS

The rapid development of the Internet has swept the world like a startup storm, it took only 20 years to completely overturn our perception of the world and still continues to influence our lives at a rate of reform every 4 years, where the secret of success is blamed on the rapid development of technology and the breakthrough innovation of hardware technology. What I would like to discuss is why Internet companies are growing so fast, easily outpacing many long-established, century-old companies in terms of development?

Well-known Internet companies such as Facebook (Facebook-Meta), Twitter (Twitter), and Google (Google) have adopted a flat management concept that gives equity incentives to the best talent and those with outstanding contributions. The KPI appraisal method allows employees to continuously generate creativity and become better. This series of talent management plans are designed to let employees bring their value to the company and tie the company's interests to their personal interests.

The management of our future company (community) should be completely decentralized, self-governed by its members, giving full play to the individual creativity of each employee, and rewarding them through community pass incentives.

In the IBAX ecosystem supports the creation of organizational structures through which members are managed.

The important bylaws and management system of the company (community) are stored on the chain, and the records cannot be modified.

Collaboration is achieved through the IBAX ecosystem, and files can be stored in Mint Node in a distributed manner.

Voting will become easier and faster, and the results will be executed contractually without human intervention.

IBAX members are scattered around the globe, and we are a tightly organized organization with a strict management system and bylaws. Unlike traditional companies, we do not need to gather in one place to work. Through IBAX's decentralized management philosophy, each person is an independent individual with a more open and bold way of thinking, and more innovative.

We believe that such decentralized companies (communities) will set off the next tech frenzy.

## 6.2 FINANCIAL FIELDS

### 6.2.1 BANKING SYSTEM

Banking system for data security in the first place, based on the blockchain elliptical symmetric encryption mechanism and HASH encryption mechanism to ensure the safe and reliable process of bank data transmission, data results through the HASH mapping of the results stored in the IBAX network, change records are clearly visible.

Bank settlement system for data volume concurrency is a clear requirement, IBAX network currently supports 3,000-10,000TPS/sec (Account/UTXO) of data concurrency, fully meet the requirements of the bank's large amount of data settlement. We are still seeking a breakthrough and will soon achieve a TPS capacity of 10,000.

### 6.2.2 BLOCKCHAIN FOR FINANCING

Many people have been treating blockchain technology as a financial attribute. In our opinion, blockchain technology is for financial services and does not have financial attributes in itself.

Finance is the internal driver of social development, and the activity of capital directly affects the cycle of economic development. In New York I met many young people with creative ideas and dreams who gave up their dreams of starting a business because of the problem of capital, and in Greece I met people's reluctance when the country was in recession.

Why are the rich getting richer and the poor getting poorer? Without discussing philosophical ethics, the explanation from the standpoint of economics is simply that the rich have the capital to make trial and error, while the poor do not even have the opportunity to make mistakes. Is there a way to change this situation by combining basic and creative and providing opportunities for the creative poor.

Establish a decentralized financial lending ecological platform through the IBAX network, with a third-party evaluator giving risk assessment results based on the lender's assets, and loan rates and risk warnings based on the risk results. An aggregated loan trading platform is established, where lenders selectively complete loans based on their own loan capacity and risk acceptance. The behavior records of both lenders and borrowers are stored on the chain and can never be changed to protect the legitimate rights and interests of both lenders and borrowers.

- ① Formation of a decentralized financial lending platform by a third-party financial assessor.
- ② Creation of a corresponding financing ecology in the IBAX network.

- ③ Creating financing applications to meet the business needs of lenders and borrowers of funds.
- ④ Creating a decentralized lending and borrowing trading platform.
- ⑤ Storing the appraisal process and lending behavior in a chain to protect the legal rights of both parties.

This type of financing not only solves the problem of financing for the poor, but also solves the problem of asset appreciation for the rich, bringing new vitality to economic growth.

## 6.3 BLOCKCHAIN AND IOT INTEGRATION

As one of the core development areas of the communications industry, the IoT is gradually evolving rapidly towards the establishment of an IoT ecology with domain focus and capacity aggregation, and the introduction of various emerging technologies has become an important means of fostering the IoT ecology in the communications industry, of which the organic integration of blockchain technology, IoT and 5G is already an integral and important part. Several points of view.

- ① Enhance network edge computing capabilities

The vast majority of current IoT environments are still based on a centralized distributed network architecture, and edge nodes are still constrained by the capabilities of centralized core nodes. The flattening of communication networks and the enhancement of network access and service capabilities through enhanced edge computing capabilities have become the development trend. The flatness of communication network has natural complementary characteristics with the decentralization of blockchain.

Using the "decentralization" mechanism and "DPoA" Consensus Mechanism of IBAX network, the core node of IoT can be decentralized to each edge node, and the core node only controls the core content or does backup. The core nodes only control the core content or do backup, and the edge nodes serve the devices in their respective areas, and can complete the authentication and accounting control functions undertaken by the original core nodes through a more flexible collaboration model and related Consensus Mechanism to ensure the security, trustworthiness and stable operation of the network. At the same time, the decentralization of computing and management capabilities can also enhance the scalability of the IoT network and support network evolution and upgrade.

- ② Enhance IoT authentication capabilities

Digital identity is a unique digital code that condenses the real identity information of users or IoT devices (including things), a digital tag that can be queried, identified and authenticated, and digital identity has an important role in representing identity in the IoT environment.

Digital pass applications combined with IBAX network can use cryptography and security algorithms to protect digital identity, thus building a more secure and convenient digital identity authentication system in the IoT environment. Digital identity using blockchain technology can use cryptography and security algorithms to protect digital identity, thus building a more secure and convenient digital identity authentication system in the IoT environment. Digital identity needs to be certified and credit endorsed by certification agencies (e.g., government, enterprises, etc.) before it is put on the chain, and after it is put on the chain, the digital identity authentication system based on IBAX network guarantees the authenticity of digital identity information and provides credible authentication services. Each device in the IoT has its own blockchain address and can be registered according to a specific address, thus protecting its digital identity from other devices.

### ③ Improve the security protection of IoT devices

Based on factors such as cost and management, a large number of IoT devices lack effective security protection mechanisms, e.g., home cameras, smart lights, street light monitors, etc. These IoT devices are vulnerable to hijacking. Hijacked IoT devices are often controlled by malware indiscriminately and perform denial-of-service (DDoS) attacks on specific network services. To solve such problems, hijacked IoT devices need to be discovered and prohibited from connecting to the communication network and disconnected from the network before they can access the target servers.

Communication operators can upgrade IoT gateways and connect them with blockchain to jointly monitor, identify and process the network activities of IoT devices to secure and improve network security.

### ④ Improve communication network operation and maintenance capability

For communication operators, the traditional communication equipment operation and maintenance, facing many problems, for example, the daily maintenance of equipment, inspection and other work will consume a lot of manpower and time, while the operation and maintenance data may also face falsification, distrust and other problems. And based on IoT and blockchain technology, these problems can be mitigated or solved. Using IBAX network, data reliability and trustworthiness can be achieved to ensure the authenticity of the O&M data. And combined with IoT technology, information interconnection between communication equipment and sensing equipment can be realized. For example, automatic sensing technology can realize automatic data collection and extend traditional equipment operation and maintenance to automatic inspection, which can greatly improve operation and maintenance work efficiency. In addition, temperature and humidity sensors or cameras can be installed at the equipment site to obtain various O&M data and environmental data in real time, or use detectors to dial the equipment regularly to detect the operation status of the equipment, etc. With the help of IOT and blockchain technology, the daily operation and maintenance of communication

equipment and inspection efficiency can be improved, and the data can be real and credible.

## 6.4 MEDICAL SERVICE

The combination of blockchain and healthcare, especially the processing of electronic medical data, is one of the important research hotspots of current blockchain applications. Effective sharing of medical data can improve the overall medical level while reducing the cost of patient care. Medical data sharing is a sensitive topic, a pain point and a key challenge for the development of applications in the healthcare industry, which mainly stems from patients' need for privacy protection of sensitive personal information.

Blockchain offers a potential solution to the healthcare data sharing challenge. The history of patient visits between different healthcare providers can be uploaded to the network, and different data providers can authorize users on the platform to grant access to the data on the channels they allow. This reduces operational costs and solves trust issues.

One of the more typical applications of blockchain in healthcare is chronic disease management. Healthcare regulators, healthcare providers, third-party service providers and patients themselves are able to share sensitive information in a protected ecosystem and coordinate the implementation of integrated chronic disease intervention mechanisms to promote effective disease control.

Imagine if a patient with a long-term chronic illness, no matter where he was on the planet, had access to continuity of care at a top medical facility because his illness records were recorded in the IBAX network and these records were credible and untampered with.

Breakthroughs in the medical field have a direct impact on the well-being of all mankind, and our standard of living will be significantly improved. Please join us in anticipation that the IBAX Foundation will be moving forward with this great project as soon as possible. A better life is coming.

## 6.5 BLOCKCHAIN ENVIRONMENTAL PROTECTION AND LOW CARBON

The environmental protection industry usually uses IOT technology to establish relevant monitoring systems to achieve functions such as automatic monitoring of key pollution sources and online monitoring of environmental quality, but there is a problem of trust in environmental monitoring equipment and monitoring data in between. Enterprises may

directly change the status of equipment and tamper with relevant data in the absence of supervision. In addition, the sharing and opening of environmental data is also difficult.

The integration of blockchain and the Internet of Things can solve the problems of end-of-pipe monitoring, low data validity and single means of monitoring in the process of environmental protection supervision. The application of blockchain technology can ensure that the identity of each environmental monitoring device can be trusted and the data is tamper-proof, which can ensure the privacy of enterprises and institutions, and also enable the necessary open sharing of environmental data. IoT blockchain can realize unified access to devices of different manufacturers, protocols, and models, establish a trusted environment for trading environmental data resources, and help the implementation of environmental protection and other policies on the ground.

Some of the more typical applications of blockchain in the environmental protection field are.

**Environmental data management:** There is a possibility of tampering during the transmission of pollution data from environmental monitoring equipment to the network. Blockchain can provide a permanent record for each monitoring and prevent tampering by applying encryption technology to enhance the reliability of data and strengthen the supervision of pollution-related enterprises. The application of blockchain technology can also realize digital tracking of the whole process of sewage discharge and avoid the influence of human factors on the accuracy of sewage data.

**One source, one file:** Environmental protection agencies use blockchain technology to build a basic information database of emission enterprises, centralize all information and pollution equipment of the recorded emission enterprises, establish a corresponding file for each pollution source, and put the file on the blockchain to prevent forgery and tampering. Blockchain technology is also used to strengthen the account verification mechanism to prevent theft of account data.

**Environmental tax:** IoT blockchain can provide a feasible technical solution for environmental tax collection. Blockchain technology can achieve network-wide consensus and common maintenance of data, and in combination with IoT can more accurately collect the emission data of emission enterprises.

## 7. BUILDING THE FUTURE TOGETHER

We accept excellent global suggestions with an open sharing attitude, we hope to improve IBAX with teams that share the same values, and we hope to build a rich ecological community with innovative companies.

We know that blockchain technology is still evolving, and we take good care of IBAX's rapid growth, and we are still improving our team's capabilities.

Based on IBAX as the basic operating platform, we leave a lot of room for imagination for upcoming developers and collaborators, and the technical foundation of IBAX is sufficient to support our ability to face the problem.

We also have these technologies that are being worked on and will soon be added to subsequent versions of the feature.

- ① Homomorphic encryption.
- ② Quantum-resistant cryptographic computing.
- ③ Consensus algorithms for hot-plugging.
- ④ DeFi and order book DEX, which enable high frequency quantitative trading.
- ⑤ NFT non-homogenized pass-throughs and decentralized NFT platforms.