Rainbow Protocol

WHITEPAPER

~ Infrastructure for future insurance ~

Written by : Rainbow

Contributors : Rainbow

Modified 2021 / 07 / 01

Version 1.0

Content

0. Summary

Rainbow is a decentralized financial market infrastructure with insurance as its core. The purpose is to develop an open insurance protocol application based on blockchain technology, build an integrated and interoperable insurance protocol matrix, and form a unified insurance infrastructure to serve the decentralized financial network. Rainbow insures individual user assets, blocks traditional insurance products, and opens up mainstream insurance sectors such as NFT insurance and derivative risk hedging insurance to create one-stop insurance product usage and services for users. The mission of Rainbow's decentralized insurance infrastructure is to take insurance as a breakthrough, encourage and improve the decentralized financial ecosystem, and promote it to become the core of the next generation of insurance infrastructure. It provides a wide range of applications and prospects for the insurance industry.

1. Overview

1.1 Background

The concept of DeFi first appeared in August 2018. It is a distributed financial platform with the characteristics of blockchain technology, financial services, open source code and sound developer communities, etc. It is mainly used in insurance, exchange, lending, stable currency, investment and other fields.

As an important pillar of modern finance, the insurance industry is developing faster than expected. In the past 30 years, the premium income has increased by 6% annually. At present, global premium income accounts for 8% of global GDP. It can be seen that the insurance industry plays a prominent role in the layout of modern financial industry.

At present, there are some decentralized insurance products in the market, all of which underwrite the vulnerabilities of smart contracts, which are mainly from hacking or other small probability events. The claim process is complex, which requires out-of-chain voting and other processes, and it is very likely that the insured users will not get timely compensation after suffering losses. And the losses must have been caused by the events prescribed by the insurance contacts. Other than that, the losses are not covered. Moreover, there are no leading projects such as lending and DEX that spread widely and affect the industry pattern in the insurance projects and insurance categories existing in the market.

In the development of decentralized insurance, there are still many problems to be solved. With the deepening development of decentralized finance, the insurance industry urgently needs a project with high visibility, wide insurance coverage and great influence, which has long-term planning and realization ability for decentralized insurance development.

1.2 Project overview

Rainbow is a decentralized financial market infrastructure with insurance as its core. Rainbow hopes to take insurance as a breakthrough, encourage and improve the decentralized financial ecosystem, and promote it to become the core of the next generation of Web3.0 infrastructure, providing a wide range of applications and prospects for the insurance industry.

Rainbow Insurance is the basic protocol to provide better asset insurance for digital asset investors. Compared with small probability events such as hackers and loopholes, Rainbow chose the common value loss of investors as a breakthrough. Users holding digital assets can enjoy the asset appreciation brought by rising prices and avoid the risks brought by falling prices of digital assets.

Rainbow insurance protocol takes DAO governance as the core of insurance coverage expansion. Premiums will flow into Rainbow cooperative lending market, and the income generated in lending market will flow into insurance protocol in reverse. The

combination of insurance and lending can reduce the risk of loss for users holding assets and obtain greater benefits.

Rainbow's vision is to create a universal supporting protocol for each insurance type and related projects, and finally create a coordinated and interconnected insurance protocol matrix, which can form the interoperability and collaboration of asset values through the insurance level, and can freely interact and integrate with other decentralized financial protocols such as DEX and lending. Rainbow's goal is to share decentralized insurance development dividends through general insurance protocols, so as to realize the integration and leap-forward development of blockchain industry insurance and traditional insurance.

2. Protocol Matrix

2.1 Insurance protocol based on RB

2.1.1 Introduction of RB insurance fund pool

Users can insure their digital assets, and the insurance cost is 0.35% of the total assets. The funds insured by users flow into the insurance fund pool. When the funds reached a certain level, Rainbow started the recovery mechanism, and all the RBs recovered in the market were used for destruction.

2.1.2 Claim mechanism

The specific compensation calculation formula is as follows:

n = C * Tassets * 0.35% * (1-Tfree/Ttotal)

n → Users get compensation tokens

C → Constant 20

Tassets → Total Funds

Ttotal → Total mining tokens: 300 million RB

Tfree → The amount of tokens that have been mined

Compensation to users is in the form of RB, and compensation will only be generated in case of loss. The amount of compensation is mainly affected by three factors:

1. The size of the insured assets

2. The proportion of losses

3. The LP value provided to RB liquidity pool

Detailed compensation rules are as follows:

Total assets of user insurance: Ta; Loss value of user: Tb; Output RB of user: M.

M = Basic output (Ma) + Loss output(Mb)

Basic output (Ma) : Total assets (Ta) are brought into the output obtained by the above formula

Loss output(Mb) : Loss assets (Tb) are brought into the above formula

Loss output is affected by the token release amount as below:

TF is the token release amount, and P is the multiplying factor.

(1) TF < = 10 million, P = 20;

(2) 10 million < TF <= 20 million, P = 10;

(3) 20 million < TF <= 60 million, P = 6;

(4) 60 million < TF, P = 4;

Mb = Tb * P;

The compensation for users is Mu: Mu = Ma + Mb.

2.1.3 Scenario simulation

Total asset value user wishes to buy insurance for: 1,000,000 USDT

Users are profitable, no RB will be rewarded.

User loss:

1. Basic output Ma: Ma = 1,000,000 * 0.0035 * 20 = 70,000RB; (Due to the small amount of mining in the early stage, the RB supply from mining is close to 0, but the actual situation is not 0)

2. Loss output Mb:

Suppose a user loses 10%, 1,000,000 * 10% = 100,000USDT. According to the above rate of loss coefficient, if the current excavated amount is less than 10 million, it will be compensated by 20 times. 100,000*20 = 2,000,000USDT. 2000000USDT is substituted into the output formula:

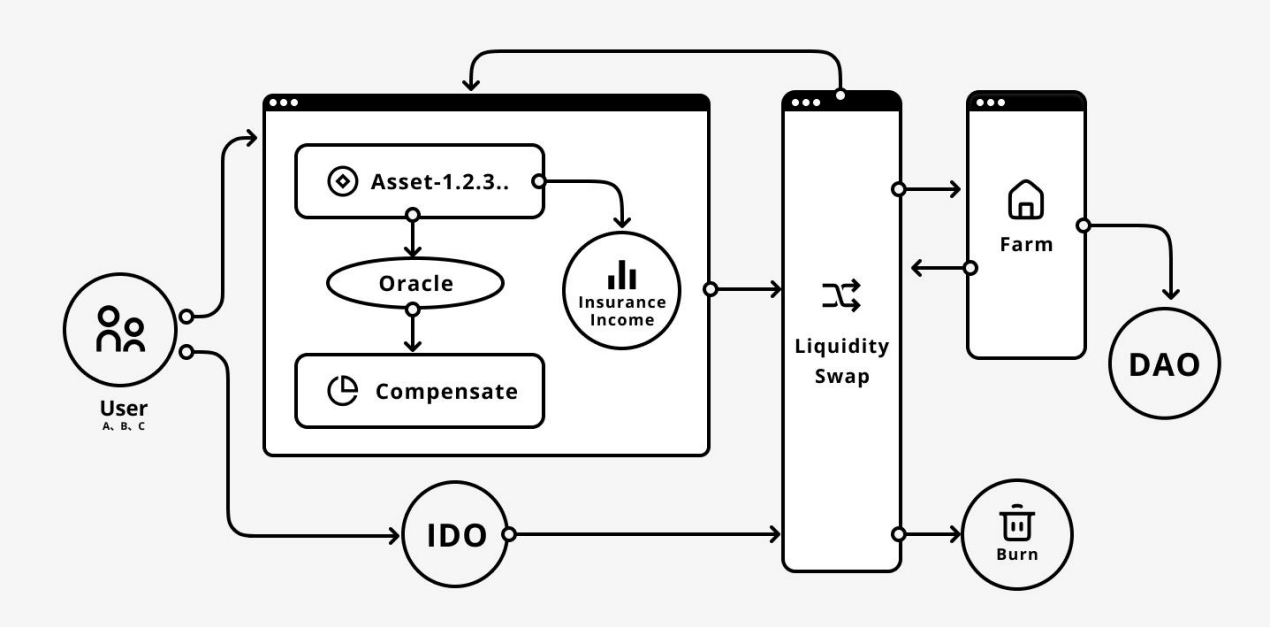
Mb = 2,000,000 * 0.0035 * 20 = 140,000RB;

Total compensation is Mu:

Mu = basic output+deficit output = Ma+Mb = 70,000+140,000 = 210,000.

2.1.4 Overall summary

On the basis of risk hedging, value insurance is carried out for users' digital assets.



2.1.5 Support assets

Currently supported digital assets: BTC,ETH,ADA,DOT. In future, more currencies will be supported according to market demand.

2.1.6 Currency application

The user or the project owner can submit the currency application, which can be passed only if the following two conditions are met:

1. The governance DAO voted for it.

2. Collection of currency loading fee: 100,000RB, and all collected RB will be burned.

2.2 Insurance protocol based on stable currency

Users put encrypted assets into Rainbow protocol platform, and the protocol channels the assets in two ways:

Insurance premium (assets paid by users to insure their assets and receive compensation related to them): converted into USDT and deposited on the lending platform, providing liquidity and collecting interest.

Insured assets (original user assets minus insurance premium): flowing into Uniswap platform to provide liquidity.

2.2.1 Introduction of stable currency fund pool

The insurance fund pool has two parts, insurance premium and surplus funds. Surplus funds are those insurance premiums whose insurance has expired or settled.Otherwise, it remains as the insurance premium.

2.2.2 Claim mechanism

Only when the user loses money will compensation be paid to the user. When the user is settled, the loss of the current user will be calculated, based on scenarios below:

1. Loss < premium, and the compensation in this case is: compensation = loss. The remaining part of the insurance premium is transferred to the surplus fund of the insurance fund pool.

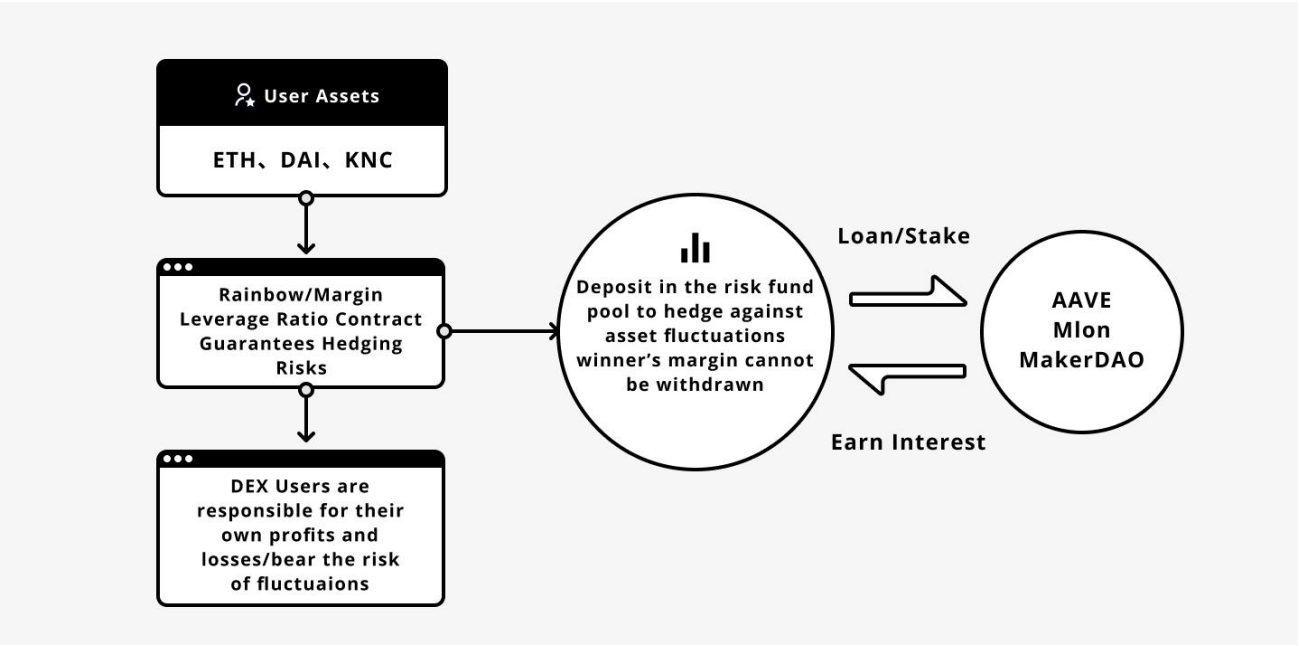
2. Loss value = user insurance premium, and the compensation in this case is: compensation = user insurance premium.

3. Loss value > user's insurance premium. In this case, the compensation is: compensation = user's insurance premium + surplus fund * the proportion of user's insurance in the current insurance fund pool (Note: the compensation is equal to the loss value at most. If the compensation calculated in this way is greater than the loss value, the remaining compensation needs to be converted back to the surplus fund in the insurance fund pool)

2.2.3 Scenarios simulation

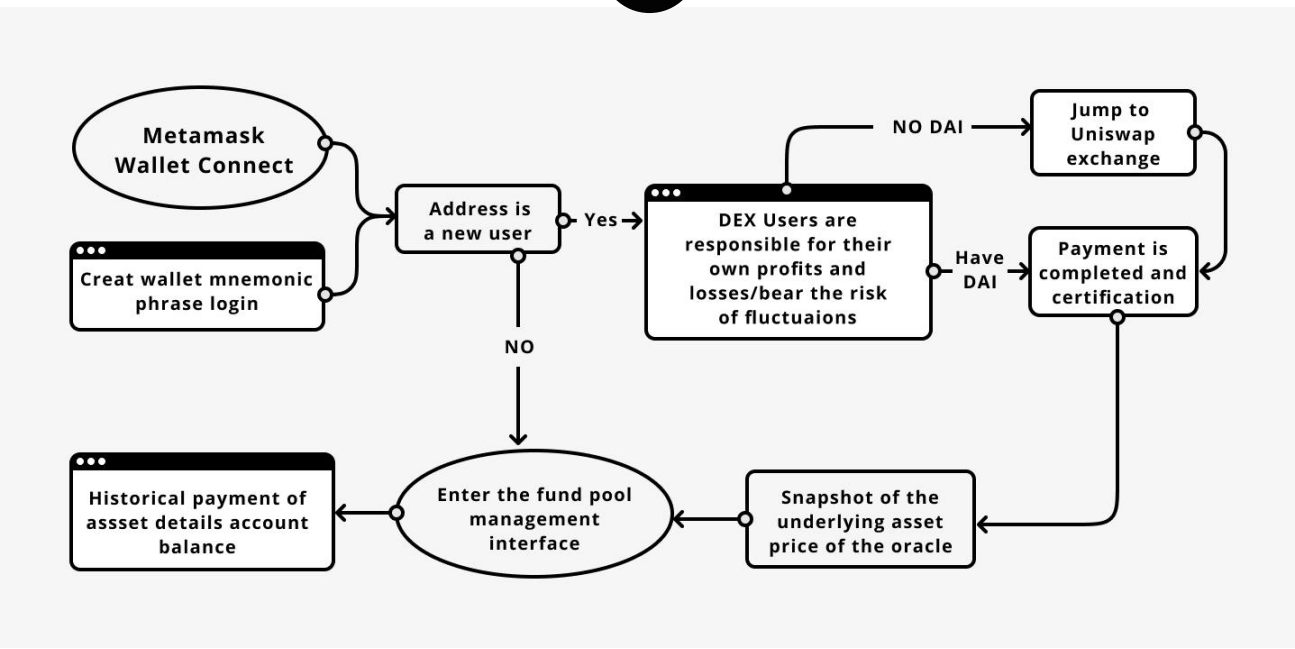
The user recharges the digital assets onto Rainbow platform and sets the insurance amount (5%~90%, which is set by the user). The protocol takes a snapshot of the assets to be used as the basis for compensation. At the same time, the insurance premium is converted into USDT and put into the insurance pool for mortgage, and the remaining digital assets will be locked. When the user needs to cancel the insurance, snapshots will be taken according to the time when the user cancels, and are compared with the previous insured snapshots. If the price rises, the insurance premium is put into the surplus fund pool and the remaining assets are unlocked; If the price falls, the remaining assets and insurance money will be unlocked and returned, and the corresponding compensation will be calculated according to the protocol.

2.2.4 Overall summary

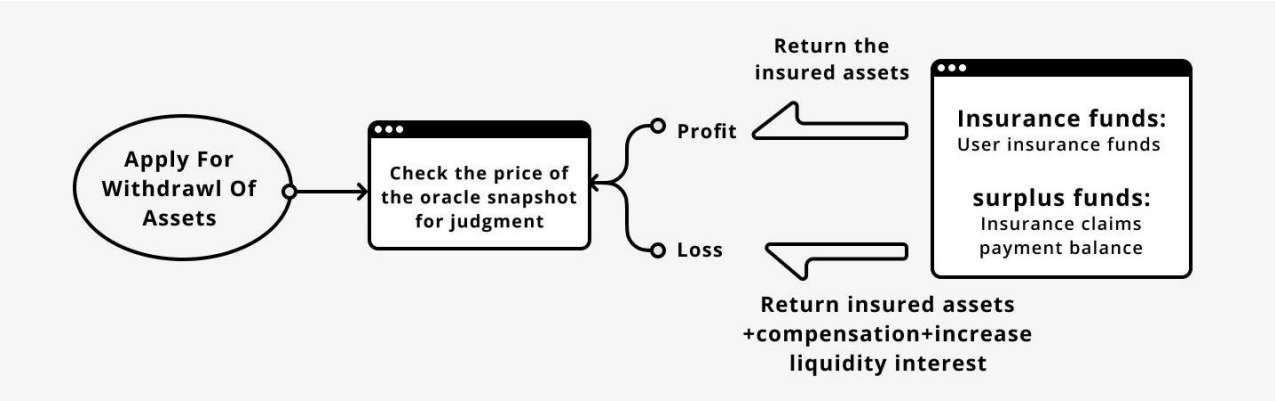


After the user deposits the digital assets into the contract through the platform, the insurance premium set by himself/herself is converted into USDT and deposited into the risk fund pool through RAINBOW contract. The risk funds earn interest through staking and loan, and the remaining insured assets are locked into a wallet.

2.2.5 User interaction



2.2.6 Compensation Logic



With the fluctuation of the market, users' assets increase or decrease in value, and the corresponding scenarios are as follows:

1. When a user makes a profit, he/she takes back his/her assets and makes settlement. At this time, the user's insurance premium will be transferred to the surplus funds in the insurance fund pool, and insured assets will be returned to this user.

2. When the user loses money, he/she takes back his/her assets and makes settlement. The user will get: insured assets + compensation + interest for providing liquidity.

2.2.7 Support assets

Currently supported digital assets: WBTC, WETH, KNC, LINK, OMG, BAT, MANA, ZRX, SNX. In future, more currencies will be supported according to market demand.

2.2.8 Currency application

The user or the project owner can submit the currency application, which can be passed only if two conditions are met.

1. The governance DAO voted for it.

2. Collection of currency loading fee: 100,000RB, and all collected RB will be burned.

2.3 Liquidity insurance protocol

2.3.1 Overall summary

At present, more than 60 billion dollars of funds are locked in the DeFi protocol. At the same time, due to smart contracts and other users who provide liquidity in DEX, there is a risk of loss (impermanence loss) as the market fluctuates violently. Liquidity insurance protocol can solve such problems by improving asset efficiency while reducing the risk of loss for users.

In the world of DeFi, the existing projects to avoid impermanence loss are not enough to cover tens of billions of market demand. When the projects cannot support impermanence losses by themselves, Rainbow can effectively avoid the risk of impermanence loss, which can not only promote the TVL growth of Rainbow, but also promote more funds to enter DeFi market.

2.3.2 Introduction of liquidity insurance pool

Rainbow allows the liquidity LP pledge of any other DeFi project, and makes up for the impermanence loss of any liquidity mining project through LP pledge. Users can withdraw, reduce or increase its liquidity at any time, and the insured amount can be automatically changed accordingly.

The insurance cost is 0.35% of LP assets. The funds insured by users flow into the insurance fund pool. When the funds reached a certain level, Rainbow started the recovery mechanism, and all the RBs recovered from the market will be destroyed.

2.3.3 Claim mechanism

The specific compensation calculation formula is as follows:

$n = C * Tassets * 0.35\% * (1-Tfree/Ttotal)$

n → Users get compensation tokens

C → Constant 20

Tassets → Total Funds

Ttotal → Total mining tokens: 300 million RB

Tfree → The amount of tokens that have been mined

Compensation will compensate users in the form of RB, and compensation will only be generated in case of loss. The amount of compensation is mainly affected by three factors:

1. The size of the insured assets

2. The proportion of losses

3. The LP value provided to RB liquidity pool

Detailed compensation rules are as follows:

Total assets of user insurance: Ta; Loss value of user: Tb; Output RB of user: Mu.

Mu = Basic output (Ma) + Loss output(Mb)

Basic output (Ma) : Total assets (Ta) are brought into the output obtained by the above formula

Loss output(Mb) : Loss assets (Tb) are brought into the above formula

Loss output is affected by the token release amount as below:

TF is the token release amount, and P is the multiplying factor.

(1) TF < = 10 million, P = 20;

(2) 10 million < TF <= 20 million, P = 10;

(3) 20 million < TF <= 60 million, P = 6;

(4) 60 million < TF, P = 4;

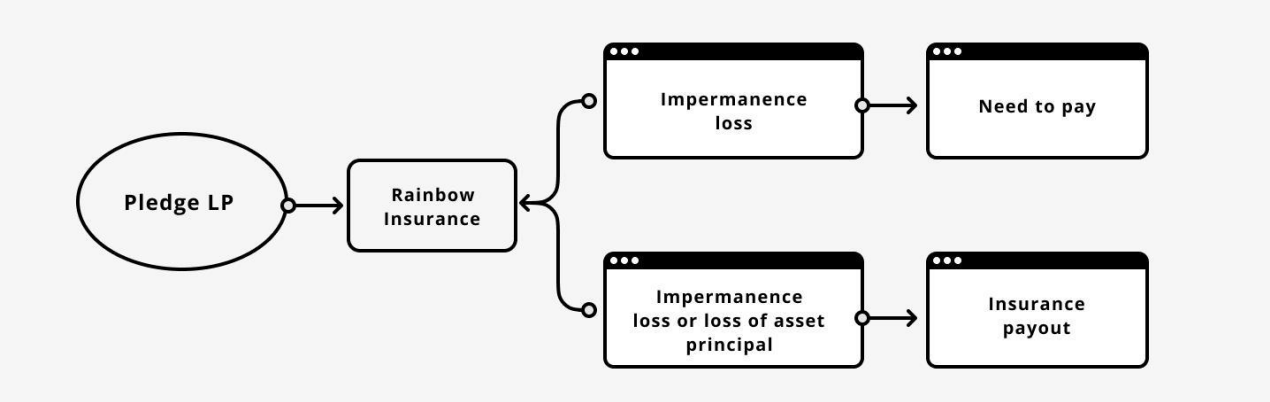
Mb = Tb * P;

The compensation for ordinary users is Mu: Mu = Ma + Mb.

2.3.4 Support assets

In future, it will gradually support all mainstream liquidity protocols and currencies.

2.3.5 Design framework



2.4 Insurance protocol based on NFT

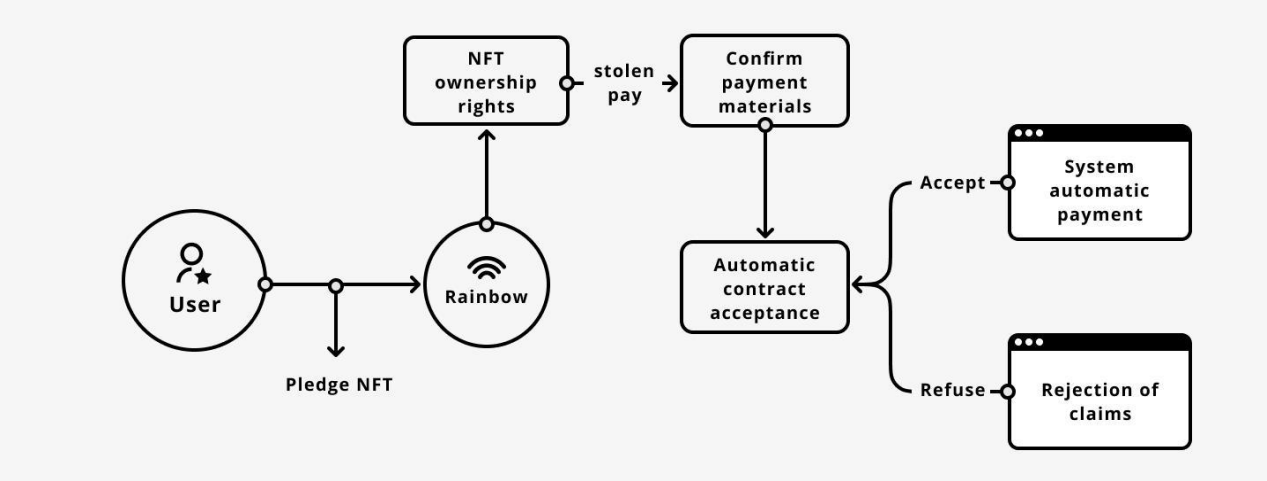
2.4.1 Overall summary

With the decline of NFT popularity, the value of many NFT projects has shrunk dramatically. However, due to the poor liquidity of NFT itself, there is no insurance

category in the market to insure the value of NFT. Rainbow designed equity insurance for the rights and interests behind NFT with reference to NXM.

NFT equity insurance, as its name implies, because of the rapid development of NFT, the price of NFT itself is supported by the related governance rights or dividend rights. However, such rights and interests can't be fulfilled easily due to changes in projects or markets. Rainbow uses a single NFT pledge insurance model to promote the NFT insurance awareness through 100% insurance compensation.

2.4.2 Design framework



2.5 Open the existing blockchain insurance protocol

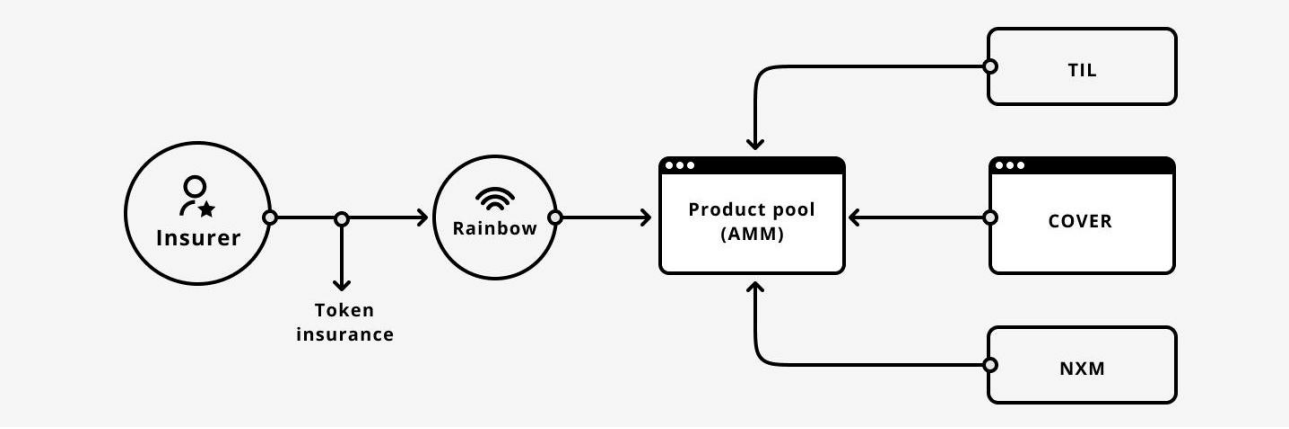
2.5.1 Overall summary

Traditional DEX has many aggregation protocols. What is aggregation protocol? Aggregation protocol has the opportunity to reduce transaction costs, improve revenue

and transaction experience. The demand for aggregation protocols naturally occurs. For users, it is important to have a more convenient entrance, more trading tools, simpler operation and lower slippage and more attractive price.

With the development of decentralized insurance, there will be more and more homogeneous insurance projects. By building a complete decentralized insurance transaction aggregator, an ecological insurance bridge beneficial to the fragmented market will be constructed. Rainbow adopts deep optimized intelligent routing algorithm and transparent price mechanism; After placing an order on the platform, users will get the lowest slippage, the least handling fee and more favorable price.

2.5.2 Design framework



2.6 Insurance protocol based on financial derivatives

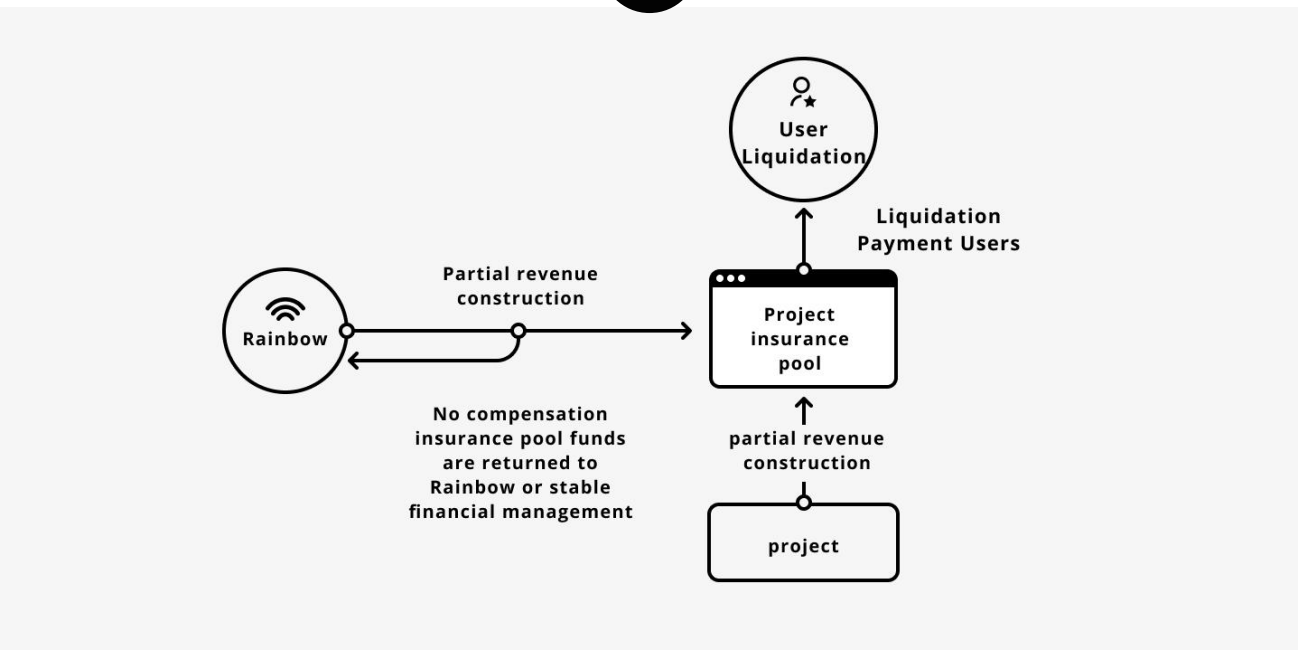
2.6.1 Overall summary

The maximum possible loss of any transaction in the spot market can only be 100%, that is, when the price of spot assets drops to zero. However, under leverage, the real loss will be greater than 100% of the initial capital.

Whenever the existing collateral does not meet the minimum requirements for opening positions, the clearing engine will start clearing positions. The liquidation of this leveraged perpetual contract position will cause risks and affect the capital withdrawal of the whole exchange. These risks increase with the fluctuation of the spot market, and the value of some accounts will quickly drop below zero, and the price slippage will often be higher.

Derivatives trading platforms usually provide limited downside, which means that they will not liquidate traders because of negative balances. On the contrary, they achieve this by creating insurance funds, which will be compensated immediately once the liquidation funds are less than the amount they should receive.

2.6.2 Design framework

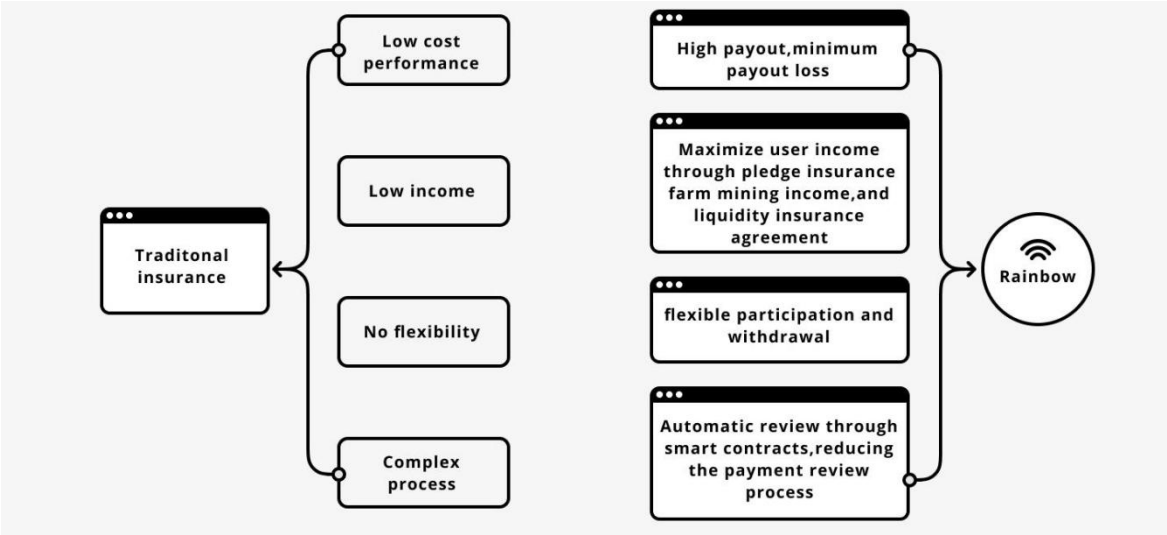


2.7 Insurance protocol based on traditional insurance products

2.7.1 Overall summary

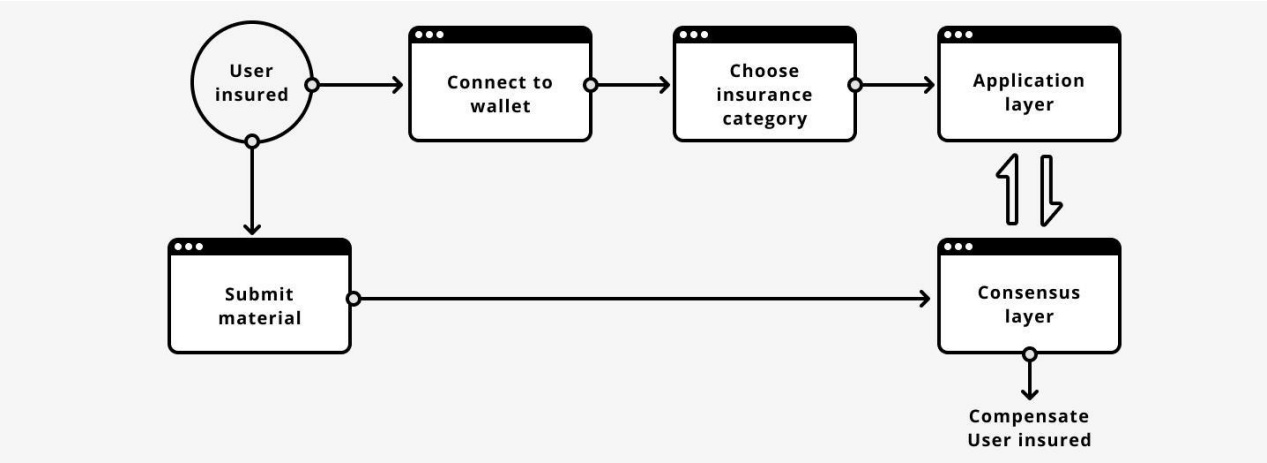
Among the troika of traditional financial industry, banks and securities have produced very mature supporting products in the blockchain industry. Except for a few blockchain insurance products, there are no products that have enough influence on the industry. Data show that in past 20 years, the total assets of the insurance industry in the Asia-Pacific market have reached 3.6 trillion USD and the premium income has reached 0.7 trillion USD. Premium income alone has become the fourth largest economy in the world, which fully shows that the blockchain of traditional insurance industry will have a broader market prospect in the future. Combine the order book under the chain with the settlement on the chain.

Insurance industry is a multi-dimensional network with a complex structure. In the process of insurance transaction, not only the interests involve various parties, the guarantor and the insurance company should be involved, but also the diversity and complexity of insurance business will become the challenge of intelligent contract settlement and liquidation. And for the landing of blockchain in the insurance field, although the credit mechanism of blockchain can reduce the links between guarantee and insurance broker and streamline the insurance transaction process. Rainbow, as the transit point of traditional insurance industry blockchain, assist in the blockchain adoption of traditional insurance and the realization of web3.0 vision.



Due to distributed governance and possibly no license fees (some blockchain software is open source code), the operating cost of blockchain is relatively low for each participant. By writing the insurance contract into the smart contract, the audit time of the user's insurance purchase and payment process is greatly reduced, which can quickly promote the commercial landing of decentralized insurance.(Centralization of the transfer of purchase insurance funds and decentralization of the payment process.)

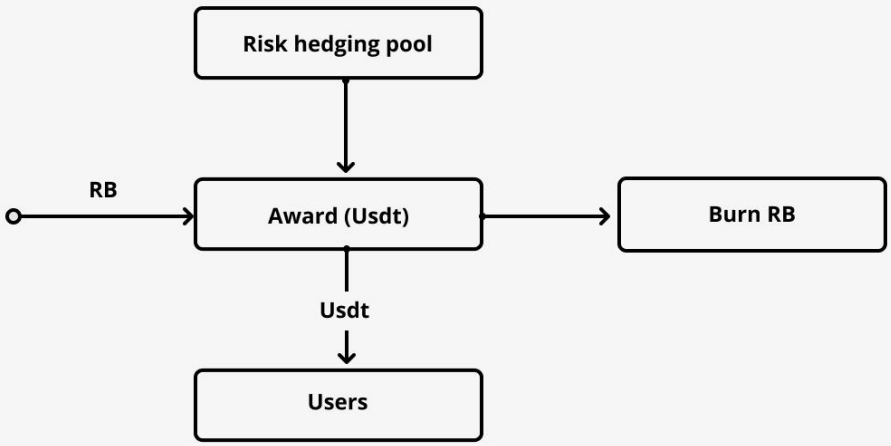
2.7.2 Design framework



2.8 Burning mechanism

2.8.1 Introduction of burning mechanism

After purchasing insurance, the user can claim RBs, and the RBs claimed by the user will enter reward mode, convert to equity, and share project incomes. Project incomes includes incomes from all insurance products, and incomes of all insurance products, which will be automatically added to the reward pool. The rewards received by users will be issued in the form of USDT, and the corresponding RBs will be burned.



3. DAO governance

3.1 Overview of Governance System

Rainbow DAO is driven by the community, governed by DAO, and has an innovative and complete economic system for autonomy. Users can use RB to govern the project, initiate proposals, vote on the development path of the project, and capture the value of the whole ecology through RB.

3.2 DAO management responsibilities

3.3 Governance nodes

Governance node is a special node nominated and selected by the community through Rainbow DAO, which has an important impact on the development of the network at a critical moment or contributed huge resources to support the whole network, and bears the responsibility of proposing, executing and supervising the healthy development of the network.

The total number of governance nodes is limited, and the selection conditions of all governance nodes require them to invest in Rainbow network in different aspects. In return, the governance node will be able to get a certain income with the growth of the network, and its future benefits in the network are bound with the long-term healthy development of Rainbow network.

The establishment of this role hopes to introduce groups or individuals with special resources and abilities to help Rainbow network connect key resources in different fields, so as to land and evolve more smoothly in the real world. At the same time, it also bears the responsibility of ensuring the stability of the network. When the

perpetrators are found in the network, the governance nodes have the obligation to investigate them and initiate punishment proposals.

4. Economic model

4.1 Distribution of tokens

Rainbow issued a total of 500 million tokens, and their distribution details are as follows:

The network incentive and mining incentive account for 60%(300 million RBs), which are released by means of investment (participation) and block incentive, and are used to maintain the operation of Rainbow network and encourage ecological development.

Strategic investors account for 20%(100 million RBs), mainly providing funds for project development, business development, partnership and ecological support. Mainly allocated to qualified investors participating in private placement and public offering.

The ecological reserved part accounts for 10%(50 million RBs), which are used to support ecological construction and external ecological cooperation, and provide funds for long-term network management, partner support, academic support, public construction and community construction.

Rainbow project team accounts for 10% (50 million RBs), which are used as the R&D and operation expenses of the project founding team for technical research, project

development, daily operation, etc. The warehouse will be locked for three months, with 5 million TGEs（Token Generation Events）, and the rest will be unlocked quarterly within 4 years.

4.2 Incentive model

Rainbow's block awards are mainly divided into four parts: mining awards, investment (participation) insurance awards, ecological internal incentives and ecological cooperation incentives.

Among them, mining rewards are obtained by DeFi, investment (participation) insurance rewards will be distributed to eligible insured users according to the rules, ecological internal incentives will be continuously distributed to different ecological contributors according to ecological development needs and conditions at different stages of the network, while ecological cooperation incentives are reserved for cooperative contributors who are conducive to promoting the whole ecological development.

5. Commercial product construction and use cases

5.1 Innovation of insurance varieties in blockchain industry

At present, the decentralized insurance development category is basically in a stagnant state, and the existing market insurance types cannot cover the broad user needs. Rainbow can greatly enrich the insurance coverage in the existing market by brainstorming, combining the innovation mechanism of self-owned insurance and encouraging innovative insurance at the DAO governance level, so as to provide a strong guarantee for the exchanges and other upstream, middle and downstream industry chain organizations.

5.2 The channel for existing insurance projects

At present, there are many projects in the field of decentralized insurance, which are mostly incompatible with each other, and the suitable demand scenarios are also different. Based on Rainbow's application layer architecture, a general insurance bridge can be constructed, which connects all isolated insurance projects in the field and provides unified query and use services for decentralized insurance applications.

For users' insurance needs, corresponding insurance can be presented to users according to specific requirements, and help them manage insurance status scheduling. For example, for contract theft risk insurance, its NXM service content can be

automatically called on Rainbow, and the insurance status and progress can be determined on Rainbow; For currency insurance, you can use Rainbow directly.

Similarly, Rainbow can also provide peer-to-peer services for designated decentralized insurance applications. With Rainbow's advantages of no KYC and extensive coverage, it can provide users with different needs and application scenarios with high-quality insurance service experience.

5.3 The bridge of blockchain in traditional insurance industry

Benefit from Rainbow's powerful aggregation capability, traditional insurance types and projects can be deployed on Rainbow's application layer nodes to help them transfer trust, so as to achieve decentralization requirements.

For example, insurance products can be connected to Rainbow to make its payment process an automatically executable contract, which can greatly save manpower and improve manpower utilization efficiency; Insurance applications can directly use Rainbow conversion bridge function to provide users with the lowest price and strong compensation ability, and can conveniently realize user value conversion based on aggregation protocol.