Whitepaper

ISSUAA Protocol

Next generation DeFi protocol for derivatives of real world and crypto assets on blockchain

Alpha

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Content

Executive Summary

Blockchain technology and cryptocurrencies have the potential to change the lives of hundreds of millions of unbanked people worldwide to the positive. Besides the possibility to execute and receive payments without having a bank account as well as to save money without having to fear inflation and government interference, the opportunity to invest into various asset classes such as equities, stock indices, commodities, bonds and crypto assets would open up the chance for many to invest at significantly higher long term returns and to diversify risks.

However, at the moment this opportunity is unavailable. Centralized solutions, with a custodian locking up the respective assets, are difficult to realize as security laws in most countries would not allow them without the issuance of prospectuses, KYC procedures etc.

Decentralised solutions on the other hand have so far suffered from the high volatility of some of these assets. In order to make sure that decentrally issued derivative products, which mirror the value of an underlying asset, remain solvent at any given time, these assets have to be significantly over-collateralized. An example here is Synthetix, which requires a collateralization ratio of 600%. This, however, significantly limits the returns for investors which help to fund the issuance of these derivative assets.

Another significant problem with the existing systems such as Synthetix is risks associated with adding assets to the system. If synthetic assets are minted, somebody needs to take the contrary position - this role is being taken by the investors. In theory, the risk could be diversified and offset by long and short positions. However, in reality this is not the case. While there are ways to offset these risks, they require additional investments, which will further reduce returns. In reality, Synthetix investors which have provided assets to the system would have lost money in recent months, if this would not have been offset by staking rewards, which however need to run out over time.

ISSUAA thus takes a different approach to solve this problem:

- To mint synthetic derivative assets on ISSUAA, investors must deposit stable coins, which are pegged to the USD.
- Investors will receive not one but two tokens. One long token, which one to one mirrors the development of the underlying asset as well as a short token, which inversely mirrors the development of the underlying asset.

With this solution, no central counterparty, that assumes the risk of a price change, is needed and it is secured that there is always enough collateral to fund all outstanding assets.

The system will be governed by a governance token, the ISSUAA Protocol Token (ISS) and is set-up as a decentralized autonomous organization (DAO). ISS will be issued to investors which provide liquidity in the ISSUAA asset market pairs, for locking their ISS tokens and for participating in voting processes.

The rate of issuance is dependent on the delta between the amount of issued tokens as well the max. supply, which amounts to 100m ISS. Additionally, ISS will also be rewarded to investors who add liquidity to the ISS / USD stable coin LP pool on ISSUAA. This reward mechanism is designed to attract as much capital as quickly as possible, as we believe that this will significantly increase the attractiveness of the system and thus also the value of the ISS token.

The value of the ISS token will result from fees, which are generated from trading derivative ISSUAA assets. These fees will be used to buy back the ISS token on the internal market.

The ISSUAA Protocol

The ISSUAA protocol is designed to tokenize real world and crypto assets such as stocks or stock indices, commodities or crypto assets on a public blockchain. The protocol is fully decentralised, without the need to trust any centralised middleman.

The basic concept behind the ISSUAA protocol is the idea to issue synthetic assets always as a pair. When minting new assets, the user will escrow a fiat pegged stable coin. In return, the user will receive a pair of synthetic assets: A long token, which mirrors the value development and price of the underlying asset, as well as a short token, which mirrors the development of the underlying asset inversely. This means that if the price of the underlying asset increases by 1 USD, the long token will gain 1 USD in value while the short token will lose 1 USD in value. The change in value of the two assets combined does thus not change. The underlying assets will thus remain fully funded, no matter in which direction the price of the underlying asset develops.

Users that hold 1 long token and 1 short token can at any time redeem the underlying collateral by burning the two tokens.

If the price of the underlying asset increases too much, the above mentioned mechanism would eventually break as the value of the short token cannot move into negative territory. To avoid this, each asset comes with a predefined upper limit. If this upper limit is breached, the assets will be frozen. The long token can then be redeemed for the price of the upper limit without the need to also burn a short token. This mechanism is comparable with so-called knock out certificates, which are available for all larger stocks and indices in traditional finance.

To determine if an asset has breached its upper limit, users have the opportunity to notify the system that a breach has happened. This will trigger a voting process, which is performed through a smart contract. The result of this vote will determine if the asset is frozen or not.

Each synthetic asset also has a predefined expiry time. Once that time has come, a voting process is initiated which determines the asset price at the time of the expiry. Tokens can then be burned without the need to burn both sides. The proceeds are calculated based on the expiry price. This expiry time is necessary to assure that the synthetic assets closely mirror their underlying asset prices.

Voting is based on a user's holding in the protocol's governance token, veISS (ISSUAA Protocol Token), which can be minted when locking ISS tokens for up to four years. This ensures that the voters have skin in the game. If a vote would turn out to have a wrong result, this could undermine the value of the users ISS and veISS token significantly.

ISSUAA Protocol Tokens (ISS) are distributed as a fair launch. Once per week, new ISS tokens are minted and granted as rewards to users which add value to the network. This includes providing liquidity to the individual asset liquidity pools as well as participation in the governance votes.

Per week, 3% of the remaining reward pool is available for rewards. Rewards are split between veISS holders and participants in the voting processes on the one hand and liquidity providers on the other hand. The share, by which the rewards are split is dependent on the amount of veISS tokens.

The value of the ISS token is generated by trading fees. Synthetic ISSUAA assets can be traded on the ISSUAA market, which is designed as an Automated Market Maker market. Liquidity providers will receive 0.25% trading fees, while 0.05% are kept for the ISS governance token. Such proceeds are used to buy back the ISS token on the internal market.

What does the ISSUAA protocol offer to its users?

The ISSUAA Protocol addresses the needs of two different user group:

Investors seeking yield - liquidity providers

ISSUAA offers interested investors the opportunity to earn a relatively safe yield as a liquidity provider in the asset pools. Trades on the ISSUAA Protocol cost 0.30%, of which liquidity providers will receive 0.25%, while 0.05% go to the governance token. Other protocols have shown that trading volume tends to be 10% of the pool volume per day - which at 25 basis points trading fee equals roughly 10% yield per year.

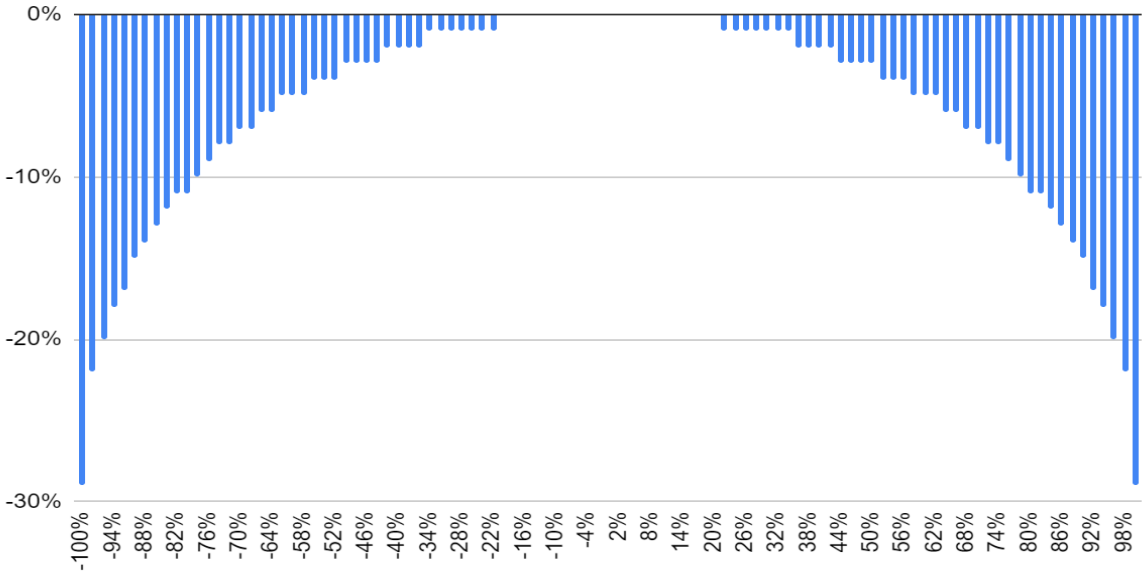
While this might not appear to be a very high return at first glance, one should keep in mind that these returns come with a comparably low risk.

Typically, liquidity providers are exposed to a significant price risk. If one of the assets in the liquidity pool depreciates significantly in value, this causes also a significant loss for the person holding the assets in the liquidity pool.

Let's assume that a liquidity provider invests 1000 US-Dollar into a liquidity pool, which consists of 50% TokenA and 50% a US-Dollar stable coin. If the price of the TokenA would drop by 50%, liquidity providers would also suffer a loss of 29%. While this is called impermanent loss as the loss would disappear if the token price would return to the original price, this is quite a misleading statement as this loss can very well be permanent.

The ISSUAA Protocol, however, allows liquidity providers to invest in both long and short tokens and to provide liquidity in the respective long and short ISSUAA Asset pools. While they would still lose slightly when the price of the asset changes, the losses would be relatively small and easy to compensate with the earned trading fee. In the above mentioned example of a drop of 50% in the value of the underlying asset, the loss for the liquidity provider would be a mere 3%[1] - which is easily compensable by the earned fees. The following graph shows the expected losses depending on the change of the underlying asset price:

[1] Assuming that the value of the long token and the short token are equal at the time of the investment



Even in the scenario of a price change of 70%, the loss for the Liquidity provider would not exceed 10%, which would likely be more than compensated by the expected trading fee.

Investors seeking exposure to stock markets, commodities etc.

While the larger crypto currencies such as Bitcoin or Ether have historically been great investments, risks associated with them are also large. Many investors will thus prefer to invest only a smaller portion of their net worth in cryptos.

However, there are many other reasons why investors would prefer to invest into a token compared to a direct investment in stocks or stock market indices.

1) No bank account is required
2) Fractional ownership is possible
3) Money locked up in crypto assets
4) Low transaction costs (depending on gas prices)
5) Arbitrage opportunities
6) Easy access to shorts
7) Crypto assets cannot be seized by governments

The ISSUAA Protocol can offer access to a variety of assets directly on chain.

Creating, minting and burning synthetic assets

The AssetFactory smart contract is used to create new Assets, convert USD stable coins into assets and to burn assets to receive USD stable coins in return.

Asset creation

When a new asset is created, the name of the underlying asset, the symbol and a short description are recorded in order to properly identify the asset and its underlying. Also, the upper limit is defined, which constitutes the price of the underlying asset when this will freeze. This data is saved by the AssetFactory smart contract and two new ERC-20 tokens are automatically deployed by the TokenFactory contract - a long token and a short token. Initially, this function will only be callable by the initial deployer of the contract, but ownership is transferred to the DAO smart contract right after the initial deployment and the creation of the first assets. The definition of new assets is then governed exclusively by the ISSUAA DAO.

Minting assets

When assets are newly minted, the minting address will be required to transfer USD stable coins into the AssetFactory contract. The minter will then receive an equal amount of long and short tokens, with the amount being defined by:

$$amount = \frac{USD\ stable\ coin\ amount}{upper\ limit}$$

Burning assets

Asset tokens can be burned at any time to redeem the locked value. There are three different scenarios that are covered by the smart contracts:

During the normal lifetime of the assets, it requires to burn an equal amount of long and short tokens to redeem the locked up capital. The amount to be redeemed is defined by:

$$USD\ stable\ coin\ amount = upper\ limit * amount\ of\ asset\ tokens$$

When an asset has been frozen, the short token is considered worthless. It thus requires only long tokens to be burned in order to redeem the locked up capital.

Finally, when an asset has expired, long and short tokens can be burned individually. The value to be redeemed for burning long tokens is defined by:

$$USD\ stable\ coin\ amount = asset\ value\ at\ expiration * amount\ of\ asset\ tokens$$

The amount of value to be redeemed from burning short tokens is defined as following:

$$USD\ stable\ coin\ amount = (upper\ limit - asset\ value\ at\ expiration) * amount\ of\ short\ asset$$

ISS & veISS Token

The ISSUAA Protocol Token (ISS) is the native token of the ISSUAA protocol. It can be used to mint veISS tokens, the governance and utility token of the ISSUAA protocol. It has three main use cases:

1. veISS tokens are the basis for the voting power of users which participate in the governance process. These votings include:
    1. Votings if an asset has breached its upper limit and should be frozen ("Freeze Votes")
    2. Votings on the price of an asset at time of expiry ("Expiry Votes")
    3. Votings on grants for services by users, that support the success of the ISSUAA protocol ("ISSUAA DAO Grant Votes")
    4. Voting if new assets are allowed to be created ("New ISSUAA Asset Proposal Votes")
    5. Voting about ISSUAA protocol upgrades ("Upgrade Votes")
2. A trading commission of 0.05% is earned for the protocol on each trade on the internal ISSUAA market place, which is used to buy back the ISS token.
3. Voting rewards, paid out as liquid ISS tokens

How to mint veISS tokens

To mint veISS tokens, a user needs to voluntarily lock its ISS tokens. In general, the longer the ISS tokens are locked, the more veISS tokens will be minted.

The max locking period is 4 years. When ISS tokens are locked for 4 years, the ratio between ISS and veISS will be 1 to 1. The relationship between the remaining lock time and the ratio of ISS to veISS is linear. This means that if tokens are locked for 1 year (eg), the ratio between ISS and veISS will be 4 to 1. Also, as the lock becomes shorter over time, the amount of veISS tokens is gradually decreasing.

To increase the number of veISS tokens, the user can at any time increase the lock time or the number of tokens locked.

Once the lock time has expired, the user can redeem the full amount of locked ISS tokens.

This "voting escrow" concept, which has been made popular by Curve Finance, allows to give more voting power (and rewards) to those users, which believe in the long term success of the protocol and have thus considerably more "skin in the game" than a user who does not lock his ISS tokens.

Trading and liquidity providing for ISSUAA Asset tokens

The ability to trade asset tokens is an integral part of the ISSUAA protocol. For each asset as well as for the ISSUAA Protocol Token (ISS) there will thus be a marketplace, which is organised as an automated market maker (AMM) or constant factor market model. The core functionality of this part has been taken from the Uniswap V2 contracts, with adaptations having been made for the remaining ISSUAA framework.

At the core of the market is the MarketFactory smart contract, which is used to deploy new market pairs and to keep track of the existing pairs.

For each individual ISSUAA asset token, i.e. for each long and each short asset token as well as for the ISS token, an individual market pair is being set up. These market pairs are ERC-20 tokens, which handle the market functionality on individual asset level. All pairs are being set up as a pair of an asset token as well as USD stable coins.

Distribution of the ISSUAA Protocol Token (ISS)

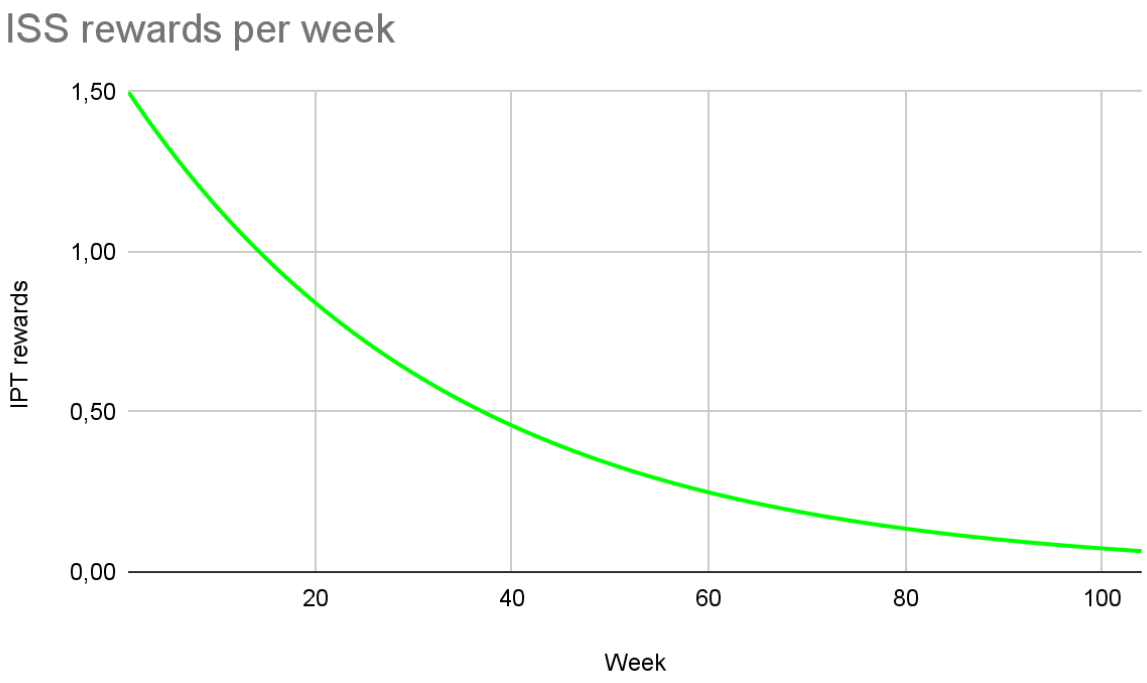
The majority (~66%; i.e. up to ~66m) of total supply (limited to 100m) of the ISSUAA Protocol Token is issued to the community/users of the platform, which add value to the platform (i.e. liquidity providers, ISSUAA DAO governance participants and voters, veISS holders). Especially in the early stage it is crucial to attract liquidity to the platform; therefore liquidity providers in the ISSUAA assets and ISS pools are rewarded with liquid ISS tokens. Also, tokens will be rewarded to users that lock their tokens for veISS tokens and to users that participate in ISSUAA DAO governance voting processes.

Bootstrapping during V1 phase

During the ISSUAA V1 phase, 35.5m IPT tokens (the predecessor of the ISS token) were issued to the early contributors (15m), angel contributors (~2m), users participating in the testing and bug bounty program (~2.5m) as well as liquidity providers (~16m). These tokens will be airdropped as ISS tokens with the start of ISSUAA V2.

Weekly rewards volume

At the start of V2, the rewards pool consists of 50m ISS tokens. Every week, 3% of the remaining reward pool will be available as rewards for liquidity providers, veISS holders and voters in the governance voting process. The following chart shows the possible distribution over the first two years - assuming that all rewards are claimed and that all liquidity providers receive the maximum possible boost factor of 2.5x on their rewards:



The percentage as well as the amount of ISS tokens, which are provided to the rewards pool, can later be changed by the ISSUAA DAO (via “Upgrade Vote”). This will likely be necessary when the ISSUAA protocol is later deployed on further chains, in order to make sure that rewards can also be paid on these additional chains.

The weekly reward pool will be split into two parts:

Rewards for veISS holders and voters

The first part is reserved for the veISS holders. Their share of rewards is calculated by dividing the Total Supply of veISS tokens by the maximum possible amount, assuming that all outstanding ISS tokens would be locked for the full 4 years. This means that ISS holders, which keep their tokens locked for the full four years, will never be diluted.

Each account has the chance to generate voting points in every individual ISSUAA DAO voting process. Voting points will be granted to those votes that are on the majority side of the vote (for yes or no votings) or not more than 1% away from the voting result for votes that ask for a price of an underlying asset.

To make sure that rewards for veISS holders are also paid in weeks with no active votes, claiming the prior weeks rewards will automatically record voting reward points in line with the current veISS holding.

Rewards for liquidity providers

The second part is reserved for liquidity providers. Each pool will get an equal contribution each week, with the exception being the ISS pool, which receives a 5x contribution compared to the other pools.

Liquidity providers can earn ISS rewards proportional to their share of LP provider tokens in the individual pools. However, the actual payout is depending on the amount of veISS tokens a user holds:

Let's assume that a user owns 10% of the LP tokens in one of the asset pools. Assuming that this pool would be rewarded 100k ISS tokens in the current rewards round, the user would be entitled to claim up to 10k ISS tokens as rewards.

Out of these 10k ISS tokens, 40% or 4k are considered the base payout. To get the full payout - i.e. a boost factor of 2.5x, the user would need to hold at least 10% of all veISS tokens. The formula for the boost factor is calculated as following:

$$boost = 1 + 1.5 * (veISS\ share / pool\ share)$$

The maximum possible boost factor is capped at 2.5x. Rewards, which are not available due to a suboptimal boost factor remain in the reward pool and will increase the rewards in the following periods.

ISSUAA DAO Grant share

5% of all ISS tokens have been minted for the ISSUAA DAO during the initial deployment and controlled by the VoteMachine smart contract. VeISS holders having a veISS balance of 100,000 tokens or more can apply for a grant of max. 100,000 ISS to be granted to anybody who should be paid for services provided for the ISSUAA DAO which the community of veISS holders consider valuable for ISSUAA. VeISS Holders will then vote whether the grant will be provided or not.

ISSUAA DAO Multisig

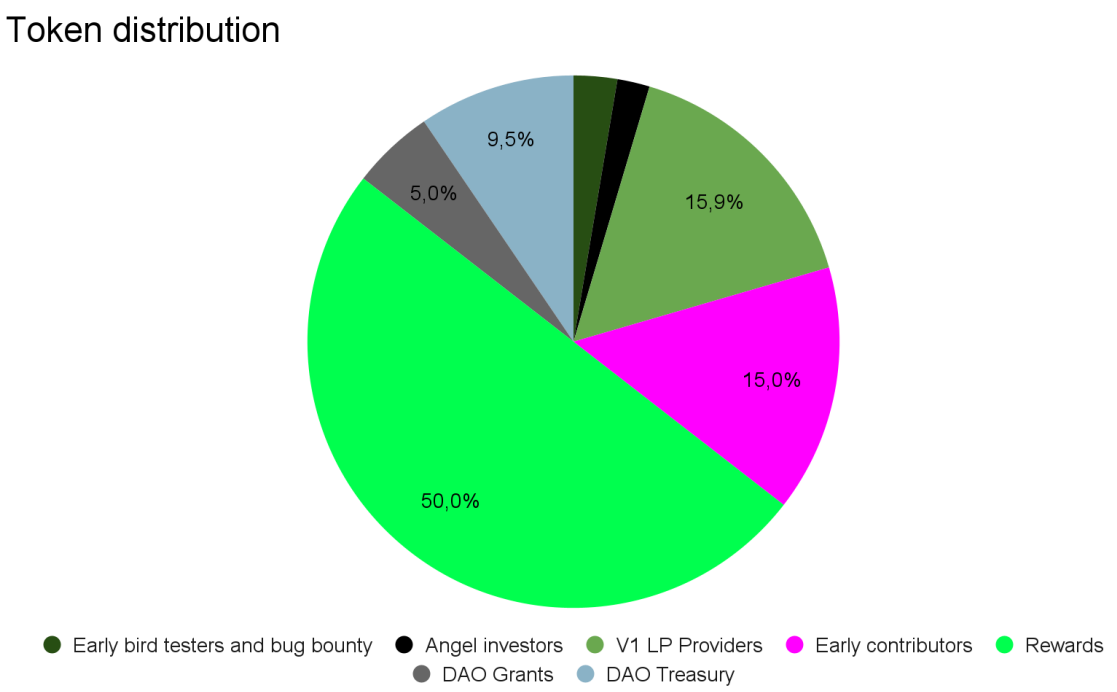
At the start of ISSUAA V2, a multisig wallet, which is controlled by (x) community members, holds roughly 9.5m ISS tokens. These tokens are intended to be used for several purposes:

- Bug bounties
- Strategic partners and investors
- Liquidity provision to the ISS token

Strategic partners and investors

ISSUAA is generally open for strategic partnerships with any partner that adds significant value to the ISSUAA protocol. This could either be other protocols or investors. Any significant investment (above 1m ISS tokens or 100k USDC) should require an onchain voting process, which then becomes binding for the multi chain signers. Funds generated from the sale will be controlled by the treasury multisig wallet. These are used to finance expenses such as audit fees and marketing expenses as well as providing liquidity for the ISS LP pools.

The following graph shows the ISS token distribution as envisaged with the start of V2 of the ISSUAA protocol:



Governance Voting by ISSUAA DAO

As a truly decentralized protocol governed by the ISSUAA DAO and in order to ensure that asset holders are receiving the fair value of the asset, ISSUAA relies on governance votes. These are undertaken by the holders of the ISSUAA Protocol Token (ISS) who locked their ISS for a certain amount of time (max. up to 4 years) and received veISS (Voting Escrow ISS Tokens) in exchange for the lock. Token holders have an implicit incentive to be honest in such voting processes, as wrong results would lead to a lack of trust in the system. This would in turn lead to lower acceptance, lower volumes, lower fees earned and also a lower valuation of their tokens.

Additionally, voting is also incentivized by the issuance of ISS reward tokens, which should further increase participation in the governance voting process - despite the gas fees this requires.

To participate in the voting process, users need veISS tokens, which they can get by locking their ISS tokens. One veISS token constitutes one vote.

Freeze votes

If an asset has surpassed the upper limit that is defined when the asset has been set up, the asset should be frozen, which means that the asset can no longer be issued and that long tokens can be burned at the price of the upper limit. Short tokens are becoming worthless.

If the upper limit is considered to be breached, veISS holders with a balance of more than 100k veISS can initiate a voting process, in which all veISS token holders can vote and decide if the upper limit has really been breached. The voting process will be open for seven days. Every veISS token holder can participate in this process, with each veISS counting for one vote.

After the 7 day voting period no more votes are accepted and the voting can be closed by anybody. If the majority has voted that the asset has breached the upper limit, the asset is frozen and all voters that have voted “yes” will receive voting points. If the majority decides that the asset has not breached its upper limit, the asset will continue trading as usual and the “no” voters will receive voting points. Voting points are the basis for the distribution of ISS token rewards for governance participation.

Expiry votes

Each asset has an expiry time, which is defined when the asset is created. After the asset is expired, a voting process can be initiated, which lets veISS holders vote on the price of the asset at the time of expiry. This will set the price, based on which long and short assets are valued. This value is the basis for the amount the user receives when tokens are burned.

After the 7 days voting period is over, no more votes are accepted and the voting can be closed by anybody. The expiry price will be calculated based on the stake weighted average price of all votes. Voters that have been in a 1% bandwidth around the calculated expiry price will receive voting points.

New ISSUAA Asset proposal votes

New ISSUAA assets can be created by a DAO decision. Firstly, a new asset needs to be proposed by a user, who has a locked ISS balance of at least 100,000 tokens; i.e. at least 100,000 veISS. This will trigger a voting process, in which every user owning veISS can participate. The voting will go on for 7 days. After the seven days voting period has expired, no more votes are accepted and any user can

close the vote. If more than 50% of stake weighted votes have been in favor of adding the asset, the new ISSUAA Asset will automatically be added as a mintable asset. If not, the asset will not be added. Voting points will be granted to users that have supported the successful option.

ISSUAA DAO Grant proposal votes

In order to be able to pay for services that users provide for the ISSUAA community, a 5% share of all ISS tokens is reserved for ISSUAA DAO Grants. To receive a grant out of this 5% DAO grant share in ISS tokens, ISS holders having a veISS balance of 100,000 tokens or more can apply for a grant of max. 100,000 ISS to be granted to anybody who should be paid for services provided for the ISSUAA DAO. The hurdle of 100k veISS is set to avoid users spamming the system with grant proposals. Users with a balance below 100k veISS thus require to find a sponsor with a holding of at least 100k veISS to initiate a grant proposal. Once the voting process is open, users can vote on the proposal for 7 days. After the voting process is over, any user can close the vote. If the majority has voted in favour of the proposal, the DAO will automatically transfer the grant amount.

Upgrade proposal votes

ISSUAA's main V2 smart contracts are designed as a proxy and implementation contract structure. This means that the mother (proxy) contracts, which hold all state variables such as balances etc. are fully immutable, but the implementation contracts can be changed. By design, the implementation contracts can only be changed by the owner of the proxy contract. Most other projects assign the ownership of their proxy contracts to a multi sig wallet, whose signers essentially control the protocol. However, ISSUAA has selected a different approach in order for the ISSUAA DAO to be as decentralized as possible. Therefore, ownership of all our proxy contracts has been assigned to a smart contract (Upgrader.sol), which can change an implementation contract only after a successful upgrade vote has concluded. To suggest an upgrade proposal vote, users of the ISSUAA protocol need to have a veISS balance of at least 500,000 veISS tokens. Upgradeable contracts are the following:

- AssetFactory
- VoteMachine
- DAO
- RewardsMachine
- MarketFactory
- VotingEscrow
- Upgrader

Multichain Approach

The ISSUAA Protocol token (ISS) token will be available as a native token on initially 7 different chains:

Polygon, Ethereum, Binance Smart Chain, Avalanche, Fantom, Arbitrum & Optimism. The token is freely bridgeable from any chain to another by using the LayerZero protocol. No protocol fee is required for the bridging process. Gas fees as well as a small relayer fee for the execution on the target chain are paid in the native token of the source chain.

This builds the basis to later implement the full protocol on more chains.

Resources

Official website:

https://www.issuaa.org

Github repository:

https://github.com/issuaa/issuaa-contracts

Discord:

https://discord.gg/CtqQ2SJQ

Telegram:

https://t.me/issuaa_main

Twitter:

https://twitter.com/issuaa2

Medium blog:

https://medium.com/@issuaa