HurricaneSwap

A Liquidity Cross-chain Swap Based on Avalanche

contact@hurricaneswap.com

2021/08

Contents

Abstract

HurricaneSwap is the first cross-chain swap based on Avalanche. The primary goal of HurricaneSwap is to provide users with a better experience on Avalanche. This paper provides an overview of the initial version of HurricaneSwap and the design of a new mechanism of the cross-chain transaction, LP-bridge, codenamed Roke Protocol.

Disclosure

The information described in this paper is preliminary and subject to change at any time.

1. Introduction

HurricaneSwap is the 1st cross-chain liquidity DEX based on Avalanche. With the innovative LP-Bridge mechanism (Roke Protocol), users can trade popular assets of other chains without leaving Avalanche. And taking the advantages of Avalanche, HurricaneSwap can provide users with a high-performance, low slippage, low-cost and seamless cross-chain trading experience.

This paper provides an architectural overview of HurricaneSwap, which focuses on the differentiators and advancement of LP-bridge cross-chian transaction, also the design of HurricaneSwap V1, and the economic mechanism of its native token ($HCT).

1.1 Avalanche and Market Opportunity

Avalanche is a new blockchain network with sub-second transaction times and low fees, which features three built-in blockchains: Exchange Chain (X-Chain), Platform Chain (P-Chain), and Contract Chain (C-Chain).

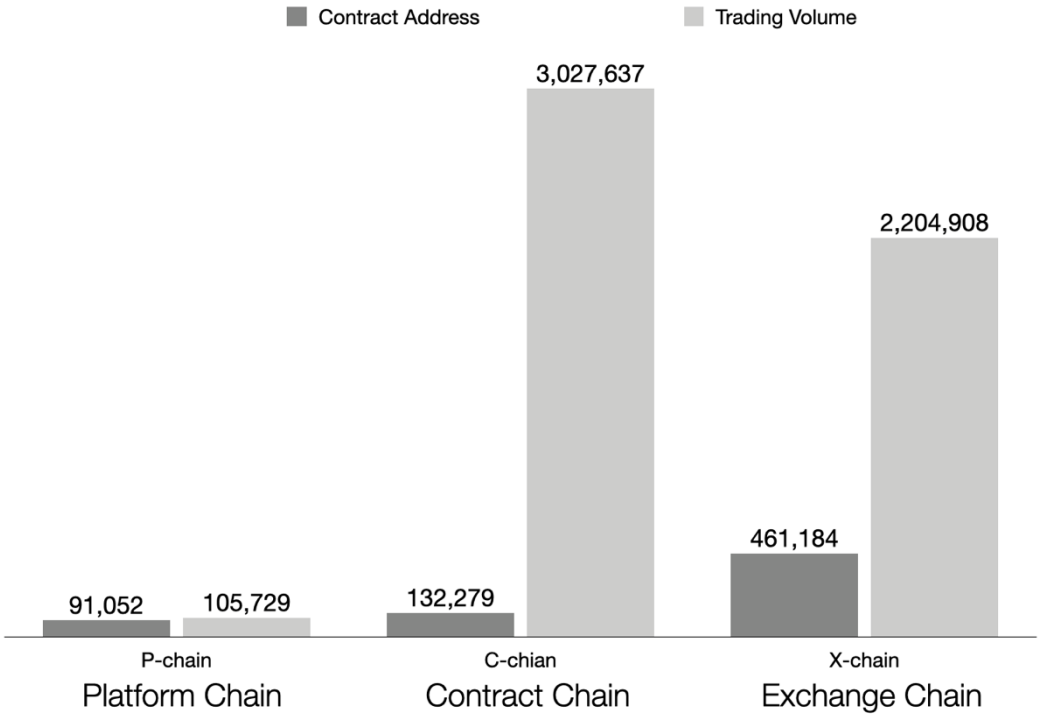
According to the public data from *CoinMarketCap*, the fully diluted market cap of Avalanche is over $842million, which means Avalanche has been in the top 6 of the largest public chain. According to the statistics on *AVASCAN*, since the launch of Avalanche-Ethereum Bridge (AEB) on February 8, 2021, Avalanche's on-chain activity has surged. The trading volume exceeded $1 million, and total pledges reached 298 million $AVAX ($9.476 billion). This data shows how rapidly Avalanche is growing and how much potential in this network.

By July 11, 2021, there are over 227 projects in the Avalanche ecosystem, covering eight main modules: DeFi, wallet, oracle, NFT+gaming, tooling+Dapp, privacy, DAO, and storage. Despite this, there is no cross-chain swap in the Avalanche ecosystem until HurricaneSwap launches.

Avalanche introduces a triple-blockchain strategy to simplify conversions and development processes. The unique design of 3 built-in blockchains improves efficiency on each chain by differentiating various needs. However, it also distracts the users.

The first blockchain is known as the Exchange chain (X-chain). X-chain is decentralized and designed to be easy to program. This network enables anyone to create and mint other smart digital assets. The Contract chain (C-Chain) was created

to simplify the conversion for Ethereum Dapp developers. As a conversion chain, C-Chain is compatible with all necessary Ethereum tooling. The Platform chain (P-Chain) is responsible for the utilities of the network. This chain is what is used to coordinate Validators.



According to statistics, the number of contract addresses on the X-chain is more than three times. The C-chain declares that over 300,000 users only trade/hold $AVAX but have not participated in the Avalanche ecosystem. It is a considerable loss, also a huge opportunity.

Serving this market requirement, HurricaneSwap designs a "bridge" that allows the cross-chain transfer of LP token pairs from other chains to Avalanche. Utilizing the proprietary LP Bridge (known as 'Roke Protocol'), HurricaneSwap supports dozens of underlying Blockchains, such as ETH, BSC, Heco, and accesses users to trade their assets from multi-chain on Avalanche.

1.2 Mission and Goals

The emergence of decentralized exchange (DEX) has contributed significantly to the development of DeFi. However, the issue of network congestion and high transaction fees had become a significant concern for investors. HurricaneSwap aims to provide a more efficient method and an advanced cross transaction mechanism to allow users to exchange their assets without network isolation.

Our primary goal in the first stage is to provide an efficient and secure environment for Avalanche users to transact with cryptocurrency on other chains. HurricaneSwap enables cross-chain swaps, which can be executed without the limitations of a standard isolated Blockchain network.

In the next stage, HurricaneSwap will launch DAO (Decentralized Autonomous Organization) and supports the vote function for listing, to refine the decentralization.

Further, HurricaneSwap will release more functions based on users' needs, for example, IDO, vault service, and leverage trading.

1.3 Features

HurricaneSwap is an advanced cross-chain swap on Avalanche, provides high-performance and low-fees, as well as unparalleled, seamless experience. It targets three main properties

Decentralized

HurricaneSwap is an anti-censorship platform that enables anyone to access it without any restrictions or KYC review. It also implies a commitment that there is no centralized control of any kind in this platform.

Secured

HurricaneSwap is designed to avoid money laundering and financial loss from hacker attacks. Its innovative LP-bridge, known as Roke Protocol, has a bidirectional verification mechanism, making it almost impossible to copy volume attack on HurricaneSwap.

Advanced

Compared to other cross-chain bridges, there is no bridge fee but only trading fees on HurricaneSwap, which is 5‰ in total and lowest than other bridges. Also, it only takes two steps, almost 15 seconds, to complete a cross-chain assets trading, which significantly reduces the cost for users.

2. Infrastructure

HurricaneSwap is a set of asset cross-chain, trading, and arbitrage tools, including a cross-chain bridge (Roke Protocol), source chain assets' station (HurricaneStation), verifier node alliance (HurricaneAlliance), and decentralized exchange (HurricaneSwap).

2.1 Roke Protocol, The LP Bridge

2.1.1 Cross-chain Bridge Definition

A blockchain bridge is a connection that allows the transfer of tokens and arbitrary data from one blockchain network to another. Although chains can have different protocols, rules, communities, and governance models, a bridge provides a compatible way to allow secure interoperability on both chains.

There are many different designs for bridges. Some of them rely on large institutions, also known as centralized bridges. Centralized bridges use a central authority or system to operate that require users to place trust in a mediator to use the service.

By contrast, decentralized bridges are those mechanisms in which users can trust the mathematical truth built into the code rather than in a single entity or authority. Trustless interaction is enforced by the system's technology (and incentive mechanism) instead of a promise or legal agreement.

2.1.2 The History of Cross-chain Transactions

The first decentralized bridge is Pegged Sidechains, a protocol under which a coin or token could be transferred from the main chain to its derivative chains. It allows for the integration of heterogeneous protocols into one chain without altering the main chain's protocol.

Except for the Sidechain solution, the Atomic Swap is also an early way of assets cross-chain. Through both Hash Timelock Contract and Hash Lock Contract, assets are locked on both chains of a cross-chain transaction and released when the conditions are met. Atomic Swap ensures the atomicity of cross-chain transactions, i.e., in a cross-chain transaction, only when all transactions on both chains are executed successfully, the Atomic Swap will release the locked assets to both sides of the cross-chain. If one of the transactions fails, all transactions will be rolled back.

However, the neck-breaking growth of the blockchain has made Pegged Sidechains and Atomic Swap obsolete. Proposed in the "Bitcoin Age," Pegged Sidechains and Atomic Swap now provide limited operation options. The popularity of Ethereum and smart contracts is demanding cross-chain solutions.

Cosmos is a decentralized network of independent parallel blockchains. It uses a set of open-source tools like Tendermint, the Cosmos SDK and IBC, to allow people to build interoperable blockchain applications quickly. Projects built on Cosmos are decentralized and thus compatible with each other.

Polkadot was designed as an underlying infrastructure to realize scalability, interoperability, and security needed for multi-chain transactions. It allows diverse layer-1 parachains to interact and communicate with each other within the same ecosystem. At the same time, Polkadot also allows parachains and external networks like Bitcoin or Ethereum to interoperate via bridges. Up till now, there are already several bridges that have already been developed or are under development. Because Polkadot was designed to minimize mediation in digital systems, trustless bridges are generally preferred within the ecosystem.

Due to the increasing demand for crypto trading and the rising cost of Ethereum transactions, many users turn to EVM-compatible chains or Layer-2 solutions, and the need for asset cross-chain increases day by day, giving rise to cross-chain bridge solutions. There is three mainstream cross-chain bridge solution: Firstly is to lock assets in the source chain and mint mapped tokens of corresponding assets in the target chain to complete the asset cross-chain; Secondly is to deploy token contracts on different chains by the token issuer to achieve the token cross-chain by lock/mint and release/burn; Thirdly is to lock liquidity on different chains and complete the cross-chain by depositing and removing assets in the liquidity pool. The representatives of the three solutions are Avalanche-Ethereum Bridge, Tether, and O3Swap, respectively.

HurricaneSwap innovatively proposes a liquidity cross-chain method: LP cross-chain where LP provides liquidity of trading pairs in the source chain and the protocol bridge the liquidity to HurricaneSwap. The protocol that implements the LP cross-chain that we call "Roke Protocol."

2.1.3 Roke Protocol

Roke Protocol is the LP bridge solution. In the cross-chain transaction and block header synchronization part, we refer to the existing cross-chain solution and redesign it according to HurricaneSwap's requirements. Here we will briefly introduce the mechanism.

The Roke Protocol implementation consists of three parts: Write Operation, Read Operation, and Synchronize Block Header.

To coordinate cross-chain transactions and communications, we set the Relayer, which synchronizes block information between the two chains and coordinates the implementation of cross-chain transactions. For Write Operation Solution, the relayer will help transfer the Write Operation from the source chain (SRC Chain) to the destination chain (DST Chain); for Read Operation Solution, the relayer will help transfer the status on the DST Chain to the SRC Chain. Whether the relay is performed correctly could be validated through the status of both the SRC Chain and the DST Chain. The Write Operation and the Read Operation scenario can be extended to one SRC Chain interoperating with multiple DST Chains.

For the sake of simplicity, below, we will only describe the scenario where one SRC Chain interoperates with one DST Chain. Moreover, the Write Operation solution and Read Operation solution are based on a mechanism of synchronizing block header, which is introduced in the Synchronize Block Header section.

Write Operation

This section will summarize the Write Operation solution and provide an overview of the cross-chain interoperability process on HurricaneSwap.

The USER in the diagram below requests cross-chain transactions. SRC MANAGER is the cross-chain management contract on the SRC Chain. RELAYER is the relayer. DST MANAGER is the cross-chain management contract on the DST Chain.

Initiate

To initiate a cross-chain Write Operation on the SRC Chain, USER sends a transaction Xsrc on the SRC Chain. The transaction Xsrc must call SRC MANAGER and provide the following information:

- *Destination blockchain Mdst ;*
- *Write Operation Qwrite ;*

Log & Retrieve

After transaction Xsrc is executed successfully, SRC MANAGER will log the following information:

- *Destination blockchain Mdst;*
- *Write Operation Qwrite;*

RELAYER will then retrieve the log sourced from the SRC MANAGER and proceed to the next stage.

Transfer

RELAYER sends a transaction Xdst on the DST Chain. The transaction Xdst must call the DST MANAGER and include the following information:

- *Write Operation Qwrite;*

- *Inclusion proof;*

The primary function of the proof is to validate the existence of the log information that contains the write operation on the SRC Chain. For example, the proof can be a Merkle path to be used in SPV2. The address can help RELAYER prove the work is successful.

Execute

After receiving the proof, DST MANAGER validates the Write Operation with the block header H (Tsrc) on the SRC Chain at block height Tsrc. If the validation is successful, DST MANAGER will execute the Write Operation Qwrite.

Validate

After Qwrite is executed successfully, RELAYER can generate a proof and send it to the SRC Chain, and the SRC Chain will validate proof and update the status of the transaction on the log.

Read Operation

This section will summarize the Read Operation solution and provide an overview of the cross-chain interoperability process. The USER in the diagram below requests a Read Operation. The SRC MANAGER is the cross-chain management contract on the SRC Chain. The RELAYER is the relayer.

Initiate

To initiate a cross-chain Read Operation on the SRC Chain, USER sends a transaction Xsrc on the SRC Chain. The transaction Xsrc must call the SRC MANAGER and contain the following information:

- *Destination blockchain Mdst;*
- *Read Operation Qread;*

Log & Retrieve

Only after transaction Xsrc is executed successfully, SRC MANAGER will log the following information:

- *Destination blockchain Mdst;*
- *Read Operation Qread;*

RELAYER will then retrieve the log sourced from the SRC MANAGER and proceed to the next stage.

Execute

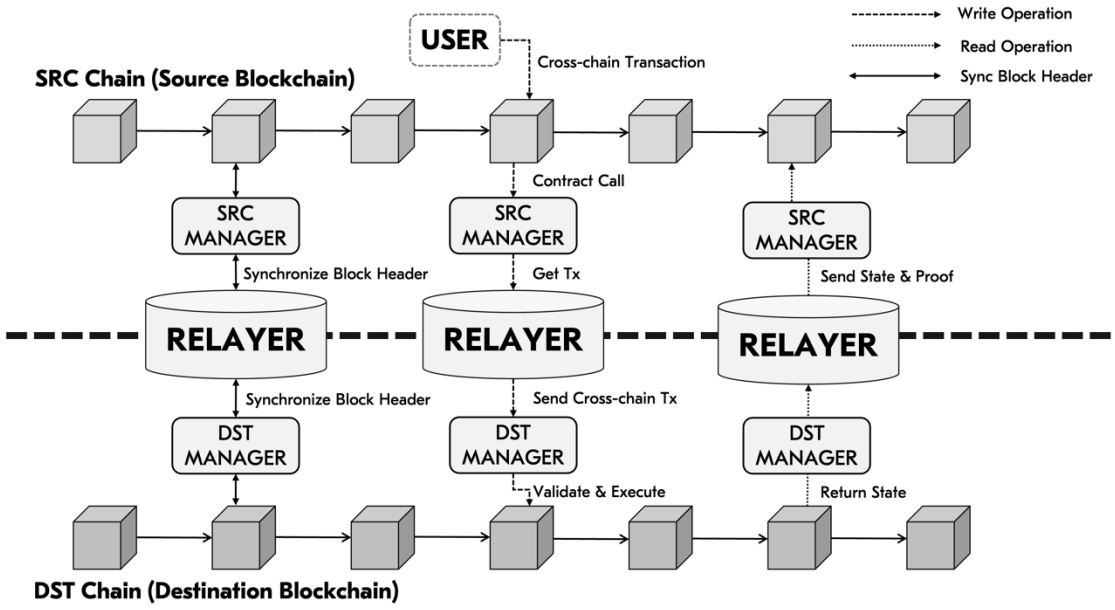
The RELAYER will infer the block height Tdst from the Read Operation Qread and then retrieve the blockchain state at block height Tdst on the destination chain Mdst. Finally, it will obtain the output of destination chain Mdst and the specific view of the output requested by Qread.

Return

The RELAYER sends the status via a call to the SRC MANAGER contract on the source chain for validation. Moreover, if the validation passes, the contract will log it and make it available to the cross-chain user.

Validate

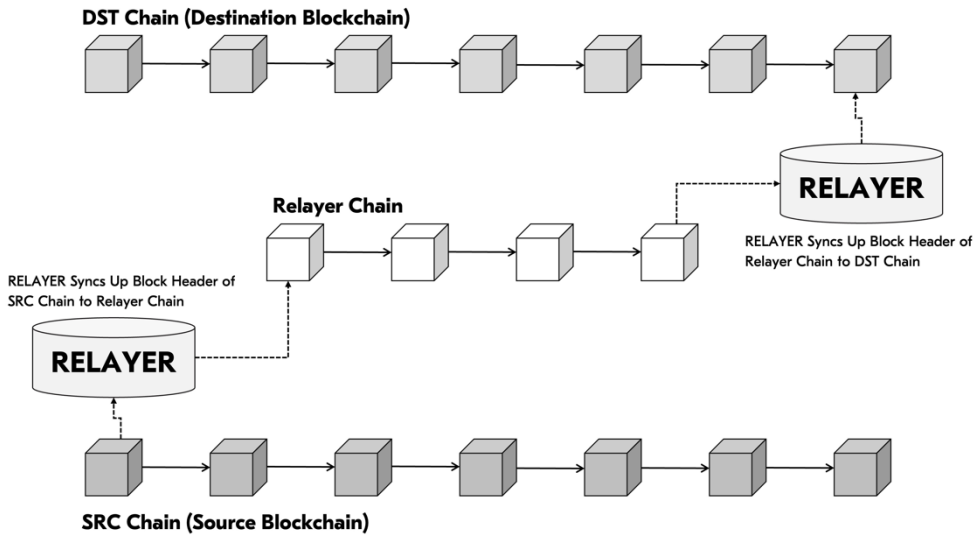
After receiving the proof and status, SRC MANAGER validates the Read Operation by checking the block header H (Tsrc) on the source chain at the block height Tsrc.



Overview of the Write & Read Operation

Synchronize Block Header

Correspondingly, to help the Relayer in Roke Protocol synchronize the participant chain's block headers, a solution is proposed based on Relayer Chain Model, simplifying the synchronization process. In this solution, RELAYER collects the participant chains' block headers and puts them in blocks in advance. This solution can prevent every participant chain from forking through its governance model. Each RELAYER will run full nodes of all participant chains to guarantee the timeliness of synchronization between all participant chains and prevent the security risk. In this way, the RELAYER will perform full verification on every block, and when an illegal block appears, they will reject it. This solution lowers the costs on each chain to O (1) as we only synchronize a single block header independently of the number of chains in the system. The Roke Protocol only needs to synchronize the participant chains' block headers and relayer chains' block headers to verify the cross-chain transaction implemented.



Blockchain Headers Synchronization Based on Relayer Chain Model

2.2 HurricaneStation

HurricaneStation is the first stop of asset cross-chain. Based on the cross-chain asset (aToken) supported in HurricaneSwap, Station will deploy on the specific chain of the cross-asset. Liquidity Providers could lock their assets in Station, generate LP token, and realize liquidity cross-chain through Roke Protocol to provide liquidity for HurricaneSwap and receive the benefits.

2.2.1 Initial Liquidity Creation

To better illustrate the initial liquidity creation process, we will create the BNB/USDT liquidity pool on BSC (Binance Smart Chain) as an example.

First, user A requests the creation of a BNB/USDT liquidity pool on BSC HurricaneStation at the current BNB price. After user A adds the corresponding amount of BNB and USDT and stakes the corresponding LP token, the corresponding contract will send a mint request on Avalanche.

Next, the node on HurricaneAlliance will receive the request and start verifying assets. Specifically, when the transaction on BSC is completed and confirmed, the node will verify if the corresponding amount of BNB and USDT has been locked. If the corresponding amount of BNB and USDT has not been locked successfully, initial liquidity creation fails, and the initial state will return.

If the mint request is verified, the node on HurricaneAlliance will confirm the request and broadcast it to other nodes. Each node on HurricaneAlliance confirms and signs the mint request independently. If the number of confirmed nodes is less than 2/3 of the total number of nodes, initial liquidity creation fails, and the initial state returns. If the number of confirmed nodes is equal to or more than 2/3 of the total number of nodes, HurricaneAlliance will execute the mint request, mint the corresponding amount of aBNB and aUSDT, and create the corresponding aBNB/aUSDT liquidity pool. Initial liquidity creation is successful, and the state flow is finished.

After that, there will be no more initial liquidity creation process but only liquidity adding process for the BNB/USDT pair.

2.2.2 Liquidity Adding on HurricaneStation

For ease of understanding, we will continue using the above example to illustrate the process of adding liquidity. The BNB/USDT liquidity pool has been successfully created on BSC after the initial liquidity creation process. The liquidity adding process for this pair in the future is as follows.

Each time a user adds liquidity on HurricaneStation, the first step is setting the tolerable transaction slippage, which currently defaults to 1%, and then adding liquidity cross-chain through Roke Protocol. Roke Protocol will later provide more tolerable transaction slippage options through DAO governance to ensure that users are able to change tolerable transaction slippage values more freely within their risk tolerance range to adjust better the success rate of adding liquidity.

The specific state process of the Roke Protocol is as follows. On the one hand, Roke Protocol collects users' BNB/USDT LP token on the source chain (BSC in this example). This LP token is acquired by adding the corresponding amount of BNB and USDT on BSC at the price of aBNB at that moment in the aBNB/aUSDT liquidity

pool on Avalanche. Suppose the time of collecting is A, the tolerable transaction slippage is 1%, aBNB price at this moment in the aBNB/aUSDT liquidity pool is 600 aUSDT, the user needs to pay 1 BNB and 606 USDT (600*(1+1%)=606) on BSC to acquire one LP token. On the other hand, Roke Protocol will also send a request to add liquidity to aBNB/aUSDT pool on Avalanche. In the subsequent two minutes (our current scheme is two minutes, we may change the value in the future based on the size of the requests for adding liquidity to external chains and DAO governance to better suit users' trading habits), we will search for liquidity adding opportunities based on the tolerable transaction slippage set by the user. Suppose the tolerable transaction slippage is 1% if no trade occurs in the two minutes between A and A+2 or if a trade does occur. However, the resulting aBNB price is within the tolerance range, in this case [594 aUSDT, 606 aUSDT], then the liquidity adding transaction is successful and marked as T'. Conversely, if a trade occurs in the two minutes between A and A+2 and the resulting aBNB price is not within the tolerance range throughout the two minutes, then the liquidity-adding transaction fails.

It is important to emphasize that HurricaneStation on BSC synchronizes all transactions that occurred on Avalanche in real-time. If Avalanche signals a failure to add liquidity, the user will recover the total amount staked at HurricaneStation on BSC, in this case, 1 BNB and 606 USDT. If liquidity is successfully added, the user needs to wait until the T' transaction is synchronized on BSC. At this point, BSC HurricaneStation will add 1 BNB and 598 USDT to the BNB/USDT liquidity pool on BSC and refund the user the overpaid amount of 606-598=8 USDT via BSC HurricaneStation. The liquidity-adding state ends. If failed to add liquidity, the user can choose whether to repeat the above process.

2.2.3 Liquidity Withdrawal on HurricaneStation

The liquidity withdrawal process is as follows (take the aBNB/aUSDT pair on Avalanche as an example).

Liquidity withdrawal can only occur after the user has successfully added liquidity at HurricaneStation. Suppose the time when user C sends a request to redeem the LP token at BSC HurricaneStation is D. Based on the amount of BNB and USDT corresponding to the user's request to redeem the LP token, a burning request is sent on Avalanche.

After the node on HurricaneAlliance has confirmed the request, the corresponding amount of token will be withdrawn from the aBNB/aUSDT liquidity pool at the real-time price of aBNB. The liquidity mining reward will be unlocked for the user. aToken and reward on Avalanche will be burned. If the burn of aToken is confirmed, the node on HurricaneAlliance will send a withdrawal request and broadcast it to other nodes simultaneously. Each node on HurricaneAlliance confirms and signs independently. If the number of confirmed nodes is less than 2/3 of the total number of nodes, liquidity withdrawal fails, and the initial state returns. If the number of confirmed nodes is equal to or more than 2/3 of the total number of nodes, HurricaneAlliance will send the confirmation success message to BSC HurricaneStation. After receiving the message, BSC HurricaneStation will transfer the corresponding token and liquidity mining reward to user A on BSC.

The withdrawal of liquidity by the user proceeds as follows (using the aBNB/aUSDT pair on Avalanche as an example).

Withdrawal of liquidity can only occur at the end of the state in which the user has successfully added liquidity at the Station. User C sends a request to redeem LP tokens at the BSC station, set the time point of the user's request to D. Based on the amount of BNB and USDT corresponding to the user's request to redeem LP tokens, a destruction request is sent on Avalanche;

After Verification Node acknowledges the request, it will withdraw the corresponding number of tokens from the aBNB/aUSDT liquidity pool at the real-time price of aBNB and unlock the liquidity mining proceeds for the user. The aTokens and proceeds on the Avalanche chain will be destroyed; if the destruction of a-tokens is not confirmed, the station liquidity withdrawal fails and returns to the initial state. If aTokens destruction is confirmed, the node will send a withdrawal message and broadcast it to other Verification Nodes; each Verification Node will sign the confirmation independently, and if the number of confirmed nodes is less than 2/3 of the total number of nodes, the station liquidity withdrawal will fail and return to the initial state. Suppose the confirmation node is more than or equal to 2/3 of the total nodes. In that case, the Alliance will submit the confirmation success message to BSC Station, which will transfer the corresponding number of tokens and the proceeds of liquidity mining to user A on the BSC after receiving the operation confirmation success message.

2.3 HurricaneAlliance

2.3.1 Introduction

Roke Protocol lays the foundation for LP cross-chain in HurricaneSwap. However, at the project's early stage, the gap in trade volume and liquidity between HurricaneSwap and DEXs on other chains will lead to the appearance of a price gap. A significant price gap causes a negative impact on user's trading experience. There are various ways to solve the problem of the price gap. Centralized exchanges use cross-exchange arbitrage strategy to narrow the price gap of token pair; decentralized exchanges on the same chain use liquidity rewards and arbitrage strategy to narrow the price gap among them.

However, due to the lack of effective means in exchanging cross-chain assets, decentralized exchanges across different chains often use a "cross-chain bridge" to narrow the price gap. When a price gap exists across different chains, narrowing it using a "cross-chain bridge" and arbitrage strategy improves user experience and brings considerable profit to the arbitrageur. Binding the right to earn arbitrage profit with on-chain governance and nodes can promote nodes to protect the exchange interests spontaneously. HurricaneSwap puts the above strategy into practice through HurricaneAlliance, utilizing arbitrage profit as an incentive mechanism to promote HurricaneAlliance to safeguard the interests of HurricaneSwap spontaneously.

A node needs to stake a certain amount of HCT to join HurricaneAlliance, responsible for tracking the price gap and executing arbitrage accordingly. If the node is unable to narrow the price gap on HurricaneSwap within the specified time, part of the staked HCT will be slashed. Besides arbitrage profit, HurricaneAlliance will also receive a portion of HCT rewards. In the following, we will explain in detail the responsibilities and incentive mechanism of HurricaneAlliance.

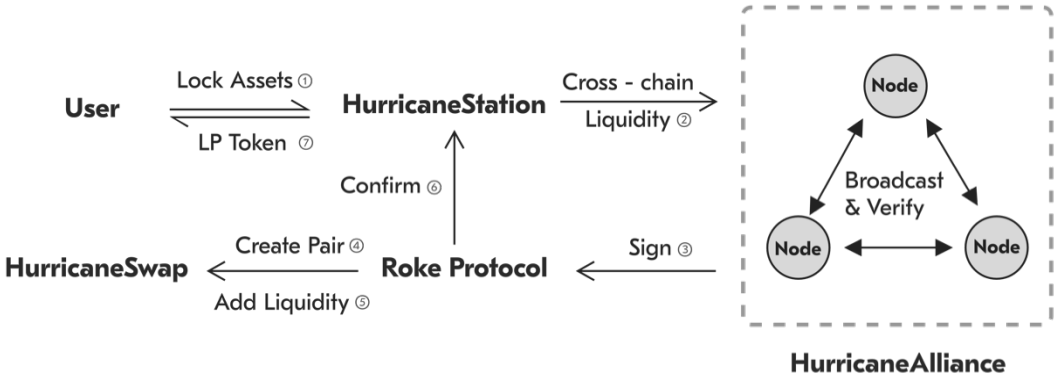
2.3.2 Responsibilities of HurricaneAlliance

Verify LPs

To add liquidity in HurricaneSwap, LPs need to lock corresponding assets in HurricaneStation at the source chain. After confirming assets have been locked, HurricaneAlliance will conduct the following verification:

- *Asset contract address satisfies the requirement of HurricaneSwap;*
- *The proportion of assets added satisfies the requirement of the corresponding trading pair;*
- *The transaction is legal and verified by a specific block;*

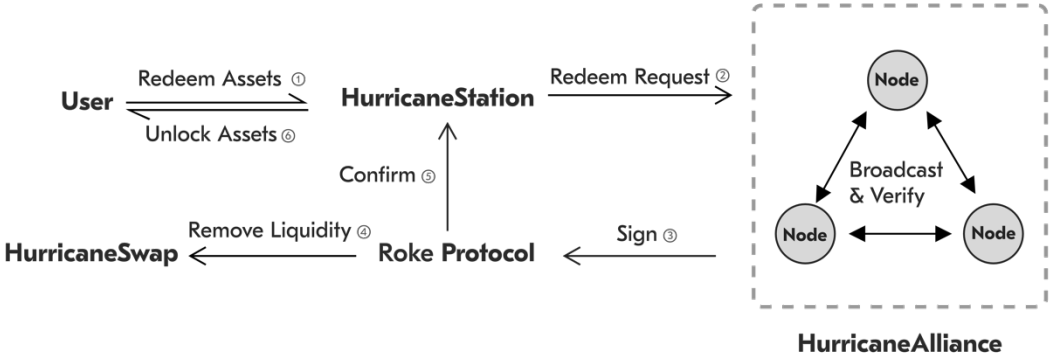
If confirmed, HurricaneAlliance will initiate the signature on the source chain. After receiving the liquidity adding transaction and the signature by HurricaneAlliance, Roke Protocol will mint corresponding aToken assets on Avalanche and add to HurricaneSwap to provide liquidity.



When LPs want to withdraw liquidity and initiate withdrawal application on HurricaneSwap, HurricaneAlliance will conduct the following verification:

- *The withdrawn asset contract is consistent with the source chain asset contract;*
- *The amount of withdrawn assets and LP profit are consistent with those of the source chain;*
- *The transaction is legal and verified by a specific block;*

If confirmed, HurricaneAlliance will initiate the signature on Avalanche. After receiving the liquidity withdrawal transaction and the signature by HurricaneAlliance, Roke Protocol will withdraw and burn the corresponding amount of aToken from HurricaneSwap's liquidity pool and unlock the corresponding amount of liquidity asset on the source chain.



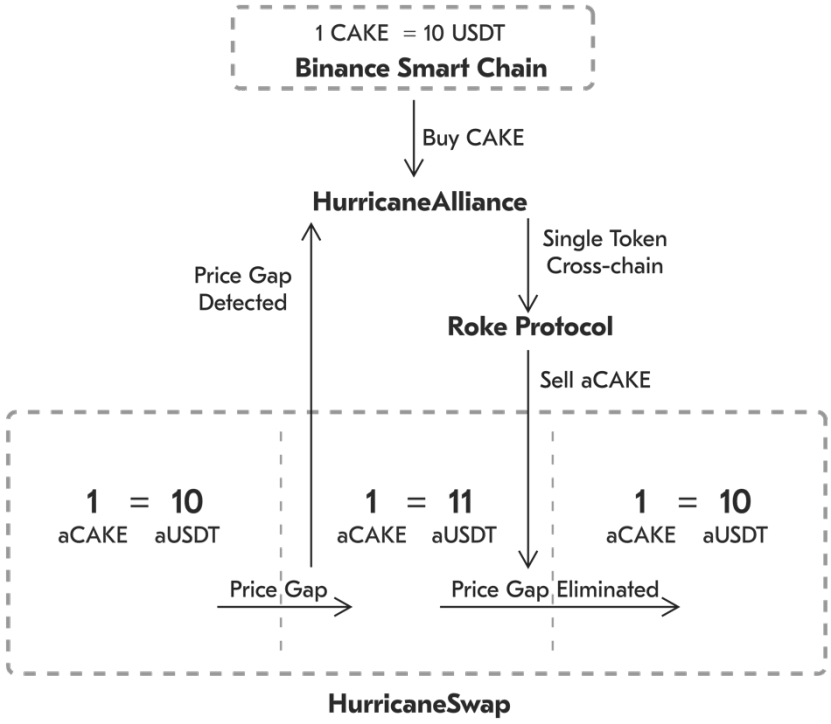
Narrow Price Gap

HurricaneAlliance is responsible for monitoring the price gap between HurricaneSwap and DEXs on other chains. When HurricaneAlliance detects that the price gap exceeds the threshold, it will narrow the gap through the single token cross-chain. The threshold is decided by the cross-chain cost of the token pair and can be adjusted by on-chain governance.

Take CAKE as an example. Suppose the CAKE/USDT pair on the BSC chain is 1 CAKE=10 USDT, whereas the price of aCAKE/aUSDT pair on HurricaneSwap is 1 aCAKE=12 aUSDT. Suppose the price gap has exceeded the threshold. To narrow the gap, HurricaneAlliance will buy CAKE on BSC chain at the price of 1 CAKE=10 USDT, generate aCAKE through a single token cross-chain, and sell aCAKE on HurricaneSwap, repeating the steps till the price gap between aCAKE/aUSDT pair and CAKE/USDT pair is below the threshold.

On the contrary, suppose the price of aCAKE/aUSDT pair is 1 aCAKE=8 aUSDT, and the price of CAKE/USDT is 1 CAKE=10 USDT. Suppose the price gap has exceeded the threshold. HurricaneAlliance will buy USDT on other chains, generate aUSDT through the single token cross-chain, and buy aCAKE on HurricaneSwap till the price gap between aCAKE/aUSDT pair and CAKE/USDT pair is below the threshold.

HurricaneAlliance can acquire the corresponding profit from executing the single token cross-chain arbitrage strategy.



2.3.3 Single Token Cross-chain

HurricaneAlliance narrows the price gap through the single token cross-chain function on Roke Protocol. When the node on HurricaneAlliance detects the gap between the price of token pair on HurricaneSwap and DEXs from other chains exceeds the threshold, it initiates the single token cross-chain request. After more than half of the nodes on HurricaneAlliance agree, the node can buy the token asset on other chains, lock it on HurricaneStation at the source chain, mint corresponding aToken and sell it on HurricaneSwap to narrow the price gap and gain arbitrage profit.

2.3.4 Staking

To avoid single token cross-chain becoming a way of malicious attack, access to this function is currently only given to verified nodes of HurricaneAlliance. One has to stake a certain amount of HurricaneToken (HCT) to join HurricaneAlliance. The minimum staking amount of HCT will dynamically change based on HurricaneSwap's TVL. If the node is unable to stake enough amount of HCT within the specified time, it will automatically exit HurricaneAlliance in the next epoch (168 hours). Nodes on HurricaneAlliance need to wait seven days to unlock staked HCT. Nodes on HurricaneAlliance are responsible for monitoring and eliminating the price gap. Part of their staked HCT will slash if any of the following happens:

- *Fail to narrow the price gap of designated token pair within the specified time;*
- *Initiate illegal single token cross-chain;*
- *Initiate single token cross-chain when price gap of token pair has not reached the threshold;*
- *No response in a long time;*

At the project's early stage, HurricaneAlliance is comprised of 7 master nodes and 14 backup nodes. The term of each master node is 24 hours. During its term, the master node is responsible for monitoring the token pairs' prices on HurricaneSwap and keeping the price gap within the threshold. When malicious behavior appears in a master node, its term automatically ends and is rotated to the next master node. The master node rotates every 168 hours.

50% of HCT slashed due to malicious behavior will be burned, the remaining 50% will enter the HCT reward pool to reward HCT holders and LPs in the form of dividends.

2.3.5 Incentive

To incentivize nodes of HurricaneAlliance to narrow the price gap and ensure the trading experience of HurricaneSwap users, becoming HurricaneAlliance can earn arbitrage profit and HCT reward.

Arbitrage profit

HurricaneAlliance gets the total portion of the profit from eliminating the price gap of token pairs on HurricaneSwap using a single token cross-chain. Take the same CAKE/USDT pair as an example, if the price of CAKE/USDT pair on the BSC chain is 1 CAKE=10 USDT, whereas the price of aCAKE/aUSDT pair on HurricaneSwap is 1 aCAKE=12 aUSDT, and the price gap has exceeded the threshold, HurricaneAlliance can earn arbitrage profit by buying CAKE on BSC chain

with 10 USDT and selling it on HurricaneSwap with 12 USDT, using single token cross-chain.

HCT reward

The node has to stake a certain amount of HCT in order to become HurricaneAlliance. Locked HCT does not earn a single token mining reward but has the right to vote and participate in DAO. 10% of total HCT will release linearly to HurricaneAlliance.

3. Tokenomics

3.1 HCT Implementation

As the native protocol token of HurricaneSwap, HCT represents the holder's rights and will continuously burn over time. The following are part of the application scenarios of HCT:

HCT Governance

HurricaneSwap is a community-driven decentralized project. After the mainnet launch, the HTC holders are expected to vote on any amendment of the protocol. Each holder's vote counts are proportional to the amount of tokens they own.

Repurchase

The 0.1% in trading fee will repurchase AVAX and HCT and airdrop to HCT holders. Another 0.08% fee in the trading of each cross-chain asset will store in the pool to provide initial liquidity when new cross-chain assets are listed on HurricaneSwap.

Vote/Stake for Listing

HurricaneSwap initially supports limited trading pairs. In addition to the initial trading pairs, holders of HCT can use voting or staking to list the popular assets of each source-chain to create trading pairs on HurricaneSwap. HCT holders can initiate a coin listing proposal through the above governance process, and it will be listed if they get a majority of votes.

3.2 HCT Allocation

The total supply of HurricaneToken (HCT) at launch will be fixed to 2,000,000,000. The planned allocation is as follows:

1) 60% for liquidity mining, totaling 1,200,000,000 HCT, releasing 1,000,000 HCT per day.

2) 4% for the Marketing budget, totaling 80,000,000 HCT, used for media, branding, and community strategy.

3) 10% for HurricaneAlliance, totaling 200,000,000 HCT, releasing 300,000 HCT per day after Token Generation Event (TGE).

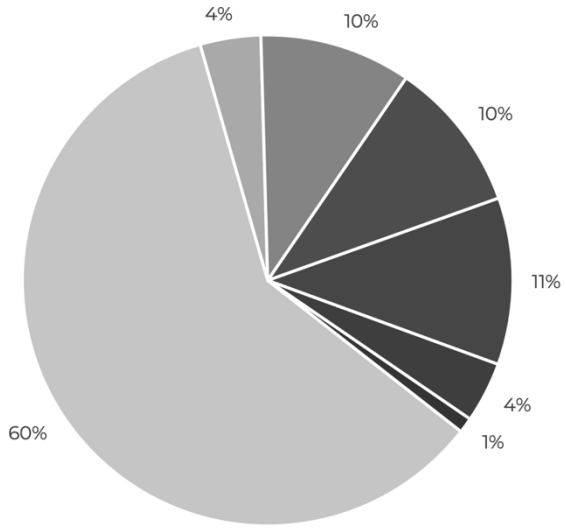
4) 10% for HurricaneSwap Team, totaling 200,000,000 HCT, with a 6-month (180-day) lock-up starting from TGE, followed by a 12-month linear release.

5) 11% for Round A investors, totaling 220,000,000 HCT, with a 3-month (90-day) lock-up starting from TGE, followed by a 12-month linear release.

6) 4% for Round B investors, totaling 80,000,000 HCT, with a 1-month (30-day) lock-up starting from TGE, followed by a 12-month linear release.

7) 1% for IDO, totaling 20,000,000 HCT.

Yield Farming	60%
Growth Fund	4%
HurricaneAlliance	10%
Team	10%
Private 1	11%
Private 2	4%
Public-sale(IDO)	1%



3.3 Trading Fee

In HurricaneSwap, fees are charged in each trading, which varies depending on the asset of the trading pair. For cross-chain assets trading (e.g., aCAKE/aUSDT), HurricaneSwap will charge a total fee of 0.5%, 0.3% as a reward for cross-chain LPs, 0.1% for repurchase AVAX and HCT and airdrop to HCT holder, 0.08% will be stored in the pool to provide initial liquidity for newly added pairs, and 0.02% to HurricaneSwap team.

For non-cross-chain assets trading (e.g., AVAX/USDT, aCAKE/AVAX), HurricaneSwap will charge a total fee of 0.3%, 0.18% as a reward for LPs, 0.1% for repurchase and airdrop to HCT holder, and 0.02% to HurricaneSwap team.

4. Discussion

Although HurricaneSwap proposes an entirely new construction of cross-chain and fully satisfies the actual needs of current users on Avalanche, it still faces a series of limitations and various internal and external concerns. The team of HurricaneSwap will do our utmost to improve the mechanism and effectively avoid the occurrence of such issues through reasonable operations.

4.1 Limitations

4.1.1 Limitations from Avalanche

The number of the wallet and contract addresses on Avalanche and the activeness of the Avalanche ecosystem determines the lower limit of transactions on HurricaneSwap, and the activeness of the Avalanche ecosystem also determines the upper limit of transactions of HurricaneSwap.

We are always considering enabling better positive cycling and continuous growth of the users on Avalanche and HurricaneSwap.

Therefore, when Roke Protocol is established, it is compatible with either EVM chain (BSC, HECO, OK chain, etc.) or non-EVM chain (Solana, Polkadot, etc.), effectively and conveniently. Conveniently connecting to new chains lays the foundation for HurricaneSwap to capture high-quality assets continuously. We

believe HurricaneSwap will be the cross-chain exchange with the most significant number of the main-chains cross and the fastest growing of cross-chain token pairs.

At the same time, with the continuous increase of cross-chain assets on HurricaneSwap, the A assets created can use AMM to construct non-AVAX cross-chain token transaction, X chain token pair/Y chain token pair (e.g., Solana token pair/BSC token pair), which users on other chains also demand. Thus, even if the Avalanche ecosystem grows too slowly, HurricaneSwap can still continuously attract users from other chains as a practical tool.

4.1.2 Limitations from EVM Chain after the Completion of Ethereum Layer-2

Once the layer-2 protocol of Ethereum is integrated, most of the advantages of EVM base chains that attract users with low gas fees will be significantly reduced, and substitutability will be higher. However, main chains like BSC that rely on centralized exchanges are not substitutable since centralized exchanges have irreplaceable advantages in new user registration, depositing, language support, marketing activities, and operational convenience. For this reason, the number of users in centralized exchanges will be higher than in decentralized exchanges. Thus, listing on centralized exchanges remains attractive to projects, and base chains depending on centralized exchanges will not be integrated in a short time by Ethereum, which has a lower gas fee. In this case, the cross-chain exchange is still a project that meets actual demand.

4.1.3 Limitations from HCT (HurricaneToken) holders

Unlike the fact that users on HurricaneSwap are limited by the number of Avalanche C-chain token holders, any user can acquire HCT through CEX. The team of HurricaneSwap will complete listing on almost all CEXs that support Avalanche C-chain tokens so that users of CEXs can purchase HCT without Avalanche wallets, which makes a minor limitation on the number of HCT holders. Meanwhile, since most CEXs are concentrated in Asia, it is necessary to have a head project in Asia when publicizing Avalanche. HurricaneSwap, which supports English and Chinese (and soon supports Korean) when launching, will surely gain the most attention and token holders due to its adequate publicity in the Asian market.

4.2 Concerns

4.2.1 Concerns on Regulatory Policies

The current regulatory policies are mainly aimed at specific CEXs and OTC sectors that do not allow legal currency depositing. Since the vast majority of users on Avalanche are concentrated in regions that have no restrictions on legal currency depositing, such as the U.S., Europe, Turkey, and Singapore, Avalanche will not be affected by such regulatory policies.

At the same time, regulatory policies and registration restrictions on CEXs are advantageous to DEXs. Due to the unique construction of DEXs, where users only use wallets as identity authentication without further KYC, regional restrictions are temporarily invalid for DEXs, and traffic restricted to enter CEXs will flow to DEXs.

4.2.2 Concerns on the Slowdown of LP growth

The cross-chain depth of HurricaneSwap is primarily affected by the cross-chain TVL contributed by LPs. Thus, besides the high reward (0.3% transaction fee) on LP staking and higher TVL proportion compared to the largest swap on Avalanche, HurricaneSwap will also continuously execute business LP attraction plans. HurricaneSwap will cooperate with trading-focused investors to jointly develop hedging strategies to lower the loss of LP, which will enable a more stable TVL on HurricaneSwap. At the same time, the equivalent of one-thousandth of transaction volume on HurricaneSwap will be used to create the initial liquidity of new cross-chain token pairs. Thus, there is sufficient initial LP each time HurricaneSwap lists a new cross-chain token pair, resulting in a lower price gap and slippage.

4.3 Future

HurricaneSwap is not just an LP cross-chain bridge & DEX, but a full set of DeFi tools built on Avalanche. HurricaneSwap is designed to provide users with abundant DeFi services. In the future, HurricaneSwap will provide DAO governance, allowing users to bring new cross-chain assets through voting; provide Vault Pool similar to Yearn.Finance to feedback more revenue to users; provide lending & synthetic assets, allowing users have leverage trading & leverage farming, etc... Our goal is to become the DeFi hub on Avalanche.

5. Reference

[1] Coinmarketcap: https://coinmarketcap.com
[2] Avascan: https://avascan.info/
[3] https://www.securities.io/what-are-digital-assets/
[4] Avalanche Bridge: https://bridge.avax.network/
[5] Avalanche Network: https://www.avax.network/