



FastLane

An Introduction to the ClearingHouse

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Abstract:

The FastLane ClearingHouse (FLCH) is a protocol designed to offer *Instant Unstaking* as a service for holders of both liquid and traditionally staked tokens. In exchange for a user's staking receipts, the FLCH will act as a clearinghouse and transfer an equivalent amount of the underlying token, minus a fee, to the user and then hold the staking receipt in its inventory until the unstaking process is complete. Protocol liquidity will be provided by depositors who are comfortable not having immediate access to their tokens and who wish to earn a portion of the fees collected from users.

To address the lack of consistency in unstaking processes and slashing mechanisms between proof-of-stake tokens, the FastLane Labs team will provide a standardized interface and base contract upon which developers can implement token-specific unstaking functions, accounting methods, fee calculations, and other necessary modules. While any DeFi operator may submit a pool, protocol governance will approve or deny pool submissions and will set the *Router's* default pool for each staking receipt. The policy target of governance is to minimize both liquidity fragmentation and fee compression.

Scope:

The FastLane ClearingHouse is a DeFi primitive and clearinghouse standard. It is a template for the construction of pools capable of swapping a proof-of-stake token for one or more of its staking receipts and then shepherding the receipt through the unstaking process.

The FLCH will launch with pools for the MATIC token paired with both traditionally staked MATIC and one or more of the available MATIC liquid staking receipts. MATIC was selected as the underlying token of the initial pools due to the FastLane team's familiarity with Polygon, its staking process, and its risk profile (slashing is currently unimplemented for MATIC staking). Pools for ETH and its staking receipts are intended to be added as unstaking becomes available.

Background:

DeFi users wishing to convert their staking receipts back into the underlying proof-of-stake token are currently limited to two options: they can either initiate the unstaking process or they can sell the staked tokens. The first option, unstaking, subjects the user to a long waiting period, while the second option, selling, is only available to the tradeable subset of staking receipts and exposes the holder to price volatility and exchange fees. The FastLane ClearingHouse introduces a third option: *Instant Unstaking*. By enabling the “missing leg” of the “staking receipt -> underlying token” arbitrage trade, the FLCH protocol will increase capital efficiency for traders, increase liquidity for stakers, and reduce the price volatility of tradeable staking receipts.

Participants:

Users:

The primary users of FLCH's *Instant Unstaking* service will generally fall into one of two categories:

1. Anyone with traditional or liquid staking receipts and a willingness to pay a premium to immediately receive their underlying tokens.
2. Algorithmic traders (bots) looking to arbitrage any pricing discrepancies between liquid staking receipts and their underlying tokens. They can accomplish this in an atomic manner that requires neither capital nor exposure to the price movement of either token.

Depositors:

DeFi participants who do not need immediate access to their tokens may deposit them in a FLCH pool of their choosing and earn a prorated share of that pool's fees. When evaluating depositing into a FLCH pool, potential depositors should understand that withdrawals from the pool are not instant; they are foregoing access to their tokens so that the FLCH's users can have instant access. The depositors could therefore be subject to a withdrawal escrow period lasting as long or longer than the maximum unstaking duration supported by the pool.

Keepers:

Many staking receipts require input at multiple stages during the unstaking process to fully settle. To keep pools running smoothly, it is expected that many *Unstaking Modules* will allocate a portion of the pool's fees to keepers: algorithmic operators in DeFi who are economically incentivized to perform the necessary transactions.

Protocol Design:

Composability:

At its core, the FastLane ClearingHouse is a protocol that establishes a composable framework and consistent interface for a variety of diverse staking receipts. Each pool will implement an unstaking function, a fee formula, keeper processes, and an accounting system. Depositors must evaluate each of these modules in the context of the overall pool when deciding which pool's code to entrust with their assets.

All FLCH pools are immutable - no changes, upgrades, or adjustments to the deployed smart contract are possible. Many liquid staking receipts are upgradeable proxy contracts and may require the deployment of new pools whenever an upgrade impacts the token's unstaking, rebasing, or slashing mechanisms. The necessity for the ClearingHouse's immutability comes from both the complexity of the modules' interactions with other modules in the pool and the sheer number of pools that would each warrant their own unique assessment prior to implementing an upgrade. Slight changes to the code via a governance upgrade could subject depositors' tokens to unintended risk that the depositors would not have requested or approved. The immutability of the FLCH pool ensures that depositors--not governance--retain sole control over which smart contract is responsible for their tokens. By intermittently checking the *Factory* for the release of new pools, depositors can perform research and can move their assets to a new pool at their own discretion.

Governance:

While governance is not empowered to upgrade, patch, or otherwise alter the code of any pool supporting depositors, it does serve two very important functions:

1. To selectively approve or reject pools submitted by developers.
 - When considering a new pool, governance is directed to evaluate on two criteria. First, they must weigh the pool's net increase in utility against its potential to fragment depositor liquidity, and second, they must determine if the pool adds new functionality with a primary mechanism other than fee compression.
2. To direct protocol users to the pool most appropriate to handle their instant unstaking needs via.
 - Governance will select a default pool for each staking receipt; users sourced by the *Router* will be forwarded to the default pool.

Developers who submit pools for review are encouraged to write abbreviated white papers that outline how their pool's modules operate and any key differences between their pool and the current "default" pool for the same staking receipt. Developers should feel free to reuse modules already published when putting together their own submission.

It is important to note that due to its partially anonymous nature, changing membership, uncertain participation rates and unknowable qualifications, governance is not responsible for assessing the security or associated risk of any pool. For certain pools, the FastLane Labs team may decide to contract external security auditors.

Modules:

To promote a consistent user experience and to drive traffic, the protocol offers a standard interface that will ensure interoperability. A ClearingHouse pool will, at a minimum, implement all of the functions and state variables declared in the abstract *BasePool* contract. Developers submitting a pool will typically need to customize the following modules:

- **Accounting Module:** responsible for ensuring that depositor balances are correctly tracked; that fees are properly allocated between keepers, depositors, and other participants; that slashing is explicitly handled (if applicable); and that the inventory's *Utilization Rate*, available balance, and other key metrics are available for the calculation of fees.
- **Settlement Module:** responsible for interfacing with one or more staking receipts, this module will allow users or keepers to initiate the unstaking process, complete the unstaking process, and handle any steps in between.
- **Fee Module:** responsible for providing the formulas for calculating user fees, keeper incentives, and any other parameters necessary for the pool to function smoothly. Fee calculations can be based on accounting metrics (E.G. *Utilization Rate* - ratio of unsettled tokens to total tokens), market conditions (E.G. the market price to swap the underlying token for its staking receipt at a Uniswap V3 pool) or any other mechanism a developer can think up. Any custom revenue sharing agreements will be included here as well (E.G. allocating a portion of the pool fees for traditional staking receipts to the validator being unstaked from to incentivize referrals and cross-marketing).

Factory & Router:

There will be two contracts that perform key roles in assisting governance and users:

- The **Factory** tracks pool submissions and links approved pools to the *Router*.
- The **Router** tracks the default pool for each staking receipt and routes users accordingly.

Note that the *Factory* and the *Router* may be combined into a singular contract.

Economics

Market Rate & Fee:

The FLCH allows users to exchange staking receipts for the underlying proof-of-stake tokens without the need to buy or sell on an exchange. While convenient, this does not mean that users will not be affected by the market rates available on exchanges. Should the price of the staking receipt drop too low, an arbitrage opportunity is created in which traders can *buy* the staking receipt on an exchange and then *unstake* the staking receipt at the FLCH. This increases the price of the staking receipt (due to the buy) and increases the *Utilization Rate* of the FLCH pool. Many*

FLCH pools' *Fee Modules* use the *Utilization Rate* as a core component; a higher rate means a higher marginal fee. The relationship between the pair's market rate at an exchange and fee at the FLCH suggest the following:

1. The FLCH will have a stabilizing effect on the exchange rate between the proof-of-stake token and its tradeable staking receipts. Should the staking receipt's price drop too low relative to the price of the underlying, the arbitrage opportunity created between the FLCH pool will have a balancing effect.
2. As the volatility of the exchange rate increases, arbitrage opportunities will increase in both magnitude and frequency, resulting in higher fee collection for the pool's depositors.
3. Higher fees will attract additional depositors, whose deposits will further augment the stabilizing effect of the pool. Conversely, the minimum spread necessary for profitable arbitrage will increase due to the increase in the marginal unstaking fee paid by the arbitrageur.

*Some FLCH pools may choose to peg the unstaking fee to the spread between the staking receipt and the underlying token, thereby collecting a portion of the arbitrageur's profits on each trade. The team at FastLane Labs looks forward to seeing the relative effectiveness (and gas cost) of such a strategy, as well as any other fee strategies that creative developers submit to the *Factory*.

Slashing & Adversarial Order Flow:

One of the most significant risks facing stakers is the possibility that the validator entrusted with their tokens could be slashed. Depositors should be aware of their vulnerability to both the initial slashing of any unsettled pool assets as well as the ensuing adversarial order flow. Users who staked with a slashed validator will attempt to exchange the *reduced* value of their toxic staking receipts for the *full* value of the FLCH pool's underlying tokens.

When assessing a FLCH pool, depositors should carefully consider the following:

1. Which validators does the pool have exposure to?
2. What is the maximum exposure the pool can have to a single validator?
3. How does the pool detect slashing?
4. How quickly does the pool detect slashing?
5. How does the pool attempt to block adversarial order flow?
6. How long after slashing is detected will it take to block adversarial order flow?
7. How does the pool allocate the losses from slashing between the depositors?
8. Does the staking receipt have any capacity to absorb any of the slashing losses?

Many of the answers to these questions will depend on the design choices made by the team behind the staking receipt. Governance should strongly prioritize the acceptance of pools using a *Settlement Module* created by this team as they are uniquely qualified to handle their token's underlying mechanisms.

Revenue Sharing:

FLCH pools have a great deal of flexibility when it comes to distribution of fees. While depositors and keepers are expected to retain the bulk of the fees, some pools may opt to allocate fees towards incentivizing a specific behavior, rewarding a key contributor, or reimbursing the costs of needful participants. Depositors are encouraged to observe the impact that this revenue sharing has on the overall volume and fee collection of the pool. For example, a pool that allocates 20% of fees to referral sources may end up having 100% more volume and therefore higher profitability than a pool that keeps all the fees for itself.

It is the FastLane team's belief that nobody is better positioned to refer users to a pool than validators and liquid staking protocols. After all, validators and liquid staking protocols are the only entities that we know have a relationship with users through the staking receipt. Therefore, to incentivize referrals and bootstrap FLCH's volume, the initial MATIC pools submitted by the team will have built in revenue sharing for validators and select liquid staking providers. While it's unfortunate that a user is unstaking, we look forward to providing users with more flexibility in how they redeem their receipt and giving validators a silver lining in the form of additional revenue.

