Positions Finance: Liquidity reEnabling Protocol

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1 Abstract

Positions protocol unlocks an innovative way to leverage the use cases of locked liquidity position on any DeFi protocol, where a user can stack yields, take a leveraged position, or lend/borrow with their locked liquidity position as collateral.

1.1 Introduction

The DeFi (Decentralized Finance) ecosystem has grown rapidly, providing numerous financial services in a decentralized manner. A common challenge in this space is the efficient utilization of locked liquidity positions. Positions Protocol aims to revolutionize how locked liquidity can be leveraged, offering a suite of innovative features that enable users to maximize the utility of their assets. This litepaper outlines the key aspects of the Positions Protocol, including lending/borrowing mechanisms with LSTs (Liquid Staking Tokens) as collateral and a yield swapping mechanism.

1.2 Thesis

The DeFi (Decentralized Finance) ecosystem, while rapidly growing and offering numerous financial services, faces significant challenges in the efficient utilization of locked liquidity positions, capital efficiency, risk management, and user accessibility.

Positions Protocol addresses these challenges by introducing a suite of innovative features that enhance the utility and flexibility of staked assets. By enabling lending/borrowing with Liquid Staking Tokens (LSTs) as collateral and facilitating peer-to-peer (P2P) yield swapping for predictable returns, Positions Protocol maximizes capital efficiency, provides immediate liquidity, and mitigates risk exposure. This integrated approach not only empowers users with greater financial freedom and efficiency but also simplifies the DeFi experience, making it more accessible and user-friendly for a broader audience.

Through these advancements, Positions Protocol aims to redefine liquidity management in the DeFi ecosystem, fostering a more inclusive, resilient, and dynamic financial environment.

1.3 Problem statement

1. **Inefficiency of Locked Liquidity**: In the current DeFi ecosystem, significant amounts of capital are locked in liquidity pools or staking positions. This locked liquidity is underutilized as it cannot be readily accessed or leveraged for other financial opportunities without being unstaked or withdrawn, which often incurs penalties or opportunity costs.

2. **Limited Capital Utilization**: Traditional staking mechanisms provide yield but restrict the ability to take leverage for other financial activities. This limitation reduces the overall capital efficiency for users who could otherwise use their staked assets to access additional liquidity.

3. **Lack of Liquidity Flexibility**: Users with assets locked in liquidity pools or staking positions face challenges when they need immediate liquidity. The process of unstaking or withdrawing from liquidity pools can be time-consuming and costly, limiting the user's ability to respond to immediate financial needs or market opportunities.

4. **Risk Exposure in Yield Generation**: Yield farming and liquidity provision often involve significant risks due to market volatility and impermanent loss. Users seeking to earn yield on their assets must balance the potential returns against these risks, often leading to suboptimal investment decisions.

5. **Fragmented DeFi Ecosystem**: The DeFi space is highly fragmented, with various protocols offering isolated services. Users frequently have to navigate multiple platforms to manage their assets, which can be cumbersome and inefficient. A unified solution that consolidates these services can greatly enhance user experience and efficiency.

6. **Inefficiencies in P2P Transactions**: Peer-to-peer (P2P) yield swapping, where users exchange liquidity positions for predefined yields, is often inefficient and lacks a structured marketplace. This leads to challenges in finding suitable counterparties and agreeing on fair terms, which can discourage participation.

7. **Lack of Predictable Returns**: Many DeFi investment strategies are subject to market fluctuations, leading to unpredictable returns. Users seeking stable and predictable income streams may find it difficult to secure guaranteed returns in the volatile DeFi environment.

1.4 Positions Finance as a Solution

1. **Unlocking Liquidity**: Positions Protocol allows users to leverage their locked liquidity positions by using staked LSTs as collateral for borrowing stablecoins. This unlocks the value of staked assets, providing users with immediate liquidity without the need to unstake or withdraw.

2. **Enhanced Capital Efficiency**: By enabling the use of LSTs as collateral, the protocol maximizes capital efficiency. Users can continue to earn yield on their staked assets while also accessing borrowed funds, effectively leveraging their capital for multiple financial activities.

3. **Immediate Liquidity Access**: The protocol provides users with the ability to borrow stablecoins instantly, ensuring that they have access to liquidity when needed. This flexibility allows users to take advantage of market opportunities or meet financial needs without delay.

4. **Risk Mitigation in Yield Swapping**: The P2P yield swapping mechanism offers users a way to exchange their UniV3 positions for predefined, risk-free yields. This reduces exposure to market volatility and provides a stable return, addressing the risk concerns associated with yield farming.

5. **Unified DeFi Services**: Positions Protocol consolidates various DeFi services, including staking, lending, and yield swapping, into a single platform. This integration simplifies the user experience and enhances overall efficiency in managing DeFi assets.

6. **Efficient P2P Marketplace**: The P2P yield swapping mechanism creates a structured marketplace where users can find suitable counterparties and agree on fair terms efficiently. This enhances the effectiveness and attractiveness of P2P yield swaps.

7. **Guaranteed Returns**: By offering predefined yields through the P2P yield swapping mechanism, the protocol provides users with predictable and stable returns. This feature appeals to users seeking consistent income streams in the volatile DeFi market.

2 Philosophy Behind Positions Protocol

1. **Empowering Financial Freedom and Efficiency**: The core philosophy of Positions Protocol is to empower users with greater financial freedom and efficiency in the DeFi ecosystem. Traditional financial systems often restrict access to liquidity and capital utilization, leading to inefficiencies and missed opportunities. By enabling users to leverage their locked liquidity positions, Positions Protocol provides immediate access to capital without the need to unstake or withdraw assets. This philosophy aligns with the broader DeFi ethos of democratizing finance, ensuring that users can maximize the utility of their assets and engage in more dynamic financial strategies. The ability to earn yields, borrow stablecoins, and engage in yield swaps through a single, unified platform represents a significant step toward more inclusive and efficient financial systems.

2. **Balancing Risk and Reward**: A fundamental aspect of Positions Protocol's design is the balance between risk and reward. The DeFi space is

inherently risky due to market volatility and the complexities of yield farming and liquidity provision. Positions Protocol addresses these challenges by offering mechanisms like P2P yield swapping, which provide predefined, risk-free yields. This feature allows users to lock in returns and reduce exposure to market fluctuations, promoting a more stable and predictable investment environment. The protocol's approach to collateralization and borrowing further enhances security by ensuring safe collateralization ratios and minimizing liquidation risks. This philosophy reflects a commitment to creating a more resilient and user-friendly DeFi ecosystem where users can confidently navigate and optimize their financial activities.

3. **Simplification and Integration for Broader Adoption**: The philosophy of simplification and integration is central to the design of Positions Protocol. The fragmented nature of the current DeFi ecosystem poses significant challenges for users, particularly those who are new to the space. By consolidating key DeFi services such as staking, lending, and yield swapping into a single platform, Positions Protocol streamlines the user experience and reduces the complexity associated with managing multiple platforms. This integration not only enhances efficiency but also lowers the barrier to entry, making DeFi more accessible to a wider audience. The protocol's user-friendly interface and comprehensive risk management tools further contribute to this philosophy, ensuring that both novice and experienced users can effectively engage with and benefit from the innovative financial opportunities offered by Positions Protocol.

3 Protocol features

3.1 Lending/Borrowing

Positions Lending/Borrowing feature enables users to lend their tokens to earn interest or use their tokens as collateral to borrow other assets. Designed with ease of use and security in mind, the protocol provides a transparent and efficient marketplace for asset lending and borrowing, leveraging smart contracts on the blockchain to automate and secure all transactions.

3.1.1 Core Features

1. **Lending**

   Users can deposit their tokens into the protocol's lending pool. In return, they receive interest-bearing tokens that represent their share of the pool and the interest earned. The interest rate is dynamically adjusted based on the supply and demand for each asset, providing competitive returns for lenders.

2. **Collateralized Borrowing**

Users can use their deposited tokens as collateral to borrow other assets. The amount that can be borrowed is determined by the Loan-to-Value (LTV) ratio, which is specific to each collateral type. This allows users to access liquidity without having to liquidate their holdings, providing flexibility for various financial strategies.

3. **Interest Rates**

   The protocol employs a variable interest rate model based on the utilization ratio of the lending pool. As the pool's utilization increases, so does the interest rate, reflecting the increased demand for borrowing. This mechanism ensures that the protocol remains liquid and incentivizes both lending and borrowing appropriately.

4. **Risk Management**

   To safeguard the protocol and its users, we implement a robust risk management framework, including collateralization ratios, liquidation mechanisms, and real-time price feeds from decentralized oracles. In the event of a significant drop in the value of collateral, automated liquidation processes are triggered to maintain the protocol's solvency and protect lenders.

5. **Security and Transparency**

   Security is our top priority. The protocol's smart contracts are thoroughly audited by reputable security firms to ensure their robustness and reliability. Additionally, all transactions and protocol operations are transparent and verifiable on the blockchain, providing users with full visibility and trust in the system.

3.1.2 How It Works

1. **Lending Process**:

   - Users deposit tokens into the lending pool.
   - Deposited tokens are available for borrowers, and lenders earn interest based on the pool's utilization.

2. **Borrowing Process**:

   - Users deposit tokens as collateral.
   - The protocol assesses the value of the collateral and determines the maximum borrowable amount.
   - Users can borrow up to a certain percentage (LTV) of their collateral's value in the form of another asset.
   - Borrowers pay interest on the borrowed amount, which accumulates over time.

3. **Repayment and Liquidation**:

    - Borrowers can repay their loans at any time, retrieving their collateral.
    - If the value of the collateral falls below a certain threshold, partial or full liquidation may occur to cover the outstanding loan, protecting the pool's liquidity.

3.1.3 Health Factor and Liquidation Mechanism

In the context of our lending/borrowing protocol, the **Health Factor** is a critical metric that determines the safety of a user's borrowing position relative to the value of their collateral. It is a numeric representation of the user's collateralization status, with higher values indicating safer positions.

3.1.4 Understanding the Health Factor

The Health Factor is calculated based on the ratio of the total value of the user's collateral to the total value of their debt, adjusted by the collateral's liquidation threshold. It provides an at-a-glance indication of the risk level of a user's position:

- **Health Factor** > 1: The user's collateral is sufficient to cover their debt, and the position is considered safe.
- **Health Factor** $= 1$: The user's collateral value is exactly at the threshold level, indicating a critical point where the collateral can only just cover the debt.
- **Health Factor** < 1: The user's collateral is insufficient to cover their debt, and the position is at risk of liquidation.

3.1.5 Liquidation Mechanism

Liquidation occurs when the Health Factor drops below 1. This situation arises when the value of the user's collateral decreases or the value of the borrowed assets increases, reducing the margin of safety. The protocol must act to protect the lending pool and maintain overall system stability.

1. **Triggering Liquidation**: When the Health Factor falls below 1, it triggers the liquidation process. The protocol automatically identifies the position as under-collateralized and the position will be liquidated by liquidators
2. **Incentives for Liquidators**: The protocol may incentivize external liquidators to participate in the liquidation process by offering a liquidation bonus or fee. This incentivizes timely liquidation actions, helping maintain the stability and solvency of the protocol.

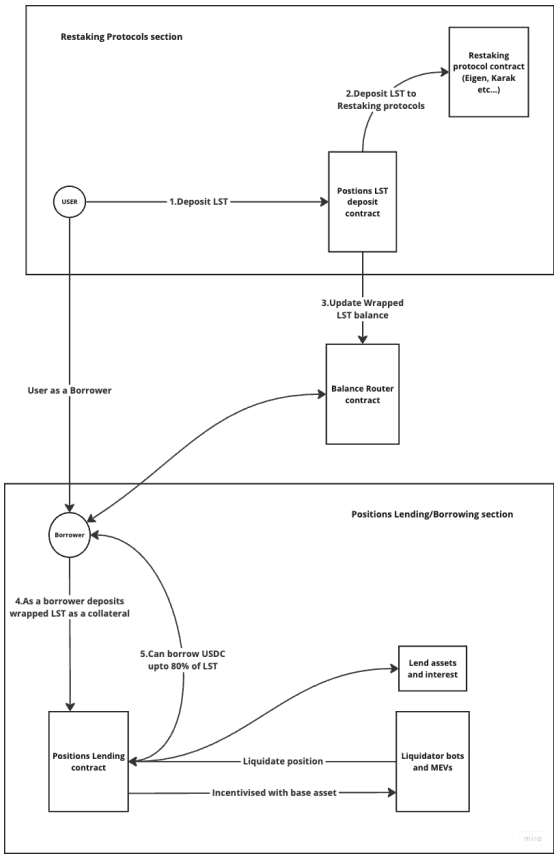

Figure 1: Lending/Borrowing architecture with LSTs as collateral

3. **User Consequences**: While liquidation protects the protocol and its lenders, it can result in losses for the borrower, as their collateral may be sold at a discount. Users are encouraged to monitor their Health Factor and take proactive measures, such as repaying part of their debt or adding more collateral, to avoid liquidation.

3.2 Lending/Borrowing with LSTs as Collateral

The Positions Protocol enables users to leverage their Liquid Staking Tokens (LSTs) by staking them and using these staked tokens as collateral to borrow stablecoins. This setup offers several advantages, including maximizing capital efficiency, earning active yield, and providing instant liquidity.

3.2.1 How It Works

Staking LSTs

- **LSTs Defined**: Liquid Staking Tokens (LSTs) represent staked assets in a blockchain network that accrue staking rewards. Unlike traditional staked assets, LSTs can be traded or used within DeFi applications while still earning staking rewards.
- **Interaction with EigenLayer and other re-staking protocols**: Users stake their LSTs to Eigen Layer through the Positions Protocol, and use the underlying staked asset as a collateral to borrow asset

Collateralization

- **Asset Collateralization**: The staked LSTs serve as collateral within the Positions Protocol. This means that the staked value of these tokens backs the user's ability to borrow stablecoins.
- **Valuation and Risk Assessment**: The protocol assesses the value of the staked LSTs based on several factors, including the staking rewards rate, market demand, and the stability of the underlying blockchain network. This valuation determines the borrowing limit and risk level associated with the collateral.
- **LTV Ratio**: To mitigate risk, the protocol enforces a Loan-to-Value (LTV) ratio, capping the amount users can borrow relative to the value of their staked LSTs. For example, an LTV ratio of 80% means that users can borrow stablecoins worth up to 80% of the value of their staked LSTs.

Borrowing

- **Stablecoin Borrowing**: Users can borrow stablecoins against their staked LSTs. The amount of stablecoins that can be borrowed is determined by the collateral value and the LTV ratio.
- **Variable Borrow rate:** In a lending protocol, the variable borrow rate is determined by the utilization ratio of the lending pool, which measures the proportion of available liquidity that has been borrowed. As the utilization ratio increases, indicating a higher demand for borrowed assets relative to the supply, the borrow rate typically rises. This dynamic adjustment encourages equilibrium by incentivizing lenders to provide more liquidity when demand is high and discouraging excessive borrowing that could deplete the pool. Conversely, when the utilization ratio is low, the borrow rate decreases, making borrowing more attractive and helping to balance the supply and demand within the pool. This mechanism ensures a responsive and efficient market, adjusting rates in real-time to reflect the current market conditions and liquidity needs.

3.3 Interest Rate Model

Positions interest rate strategy is calibrated to manage liquidity risk and optimise utilisation. The borrow interest rates come from the Utilization rate U.

U is an indicator of the availability of capital in the pool. The interest rate model is used to manage liquidity risk through user incentivises to support liquidity:

- When capital is available: low interest rates to encourage loans.
- When capital is scarce: high interest rates to encourage repayments of loans and additional deposits.

Liquidity risk materialises when utilisation is high, its becomes more problematic as UU gets closer to 100%. To tailor the model to this constraint, the interest rate curve is split in two parts around an optimal utilisation rate *Uoptimal*. Before *Uoptimal* the slope is small, after it starts rising sharply.

The interest rate R_t follows the model:

$$if U < U_{optimal}: \quad R_t = R_0 + \frac{U_t}{U_{optimal}} R_{slope1}$$

$$if U \geq U_{optimal}: \quad R_t = R_0 + R_{slope1} + \frac{U_t - U_{optimal}}{1 - U_{optimal}} R_{slope2}$$

- When $U < U_{optimal}$ the borrow interest rates increase slowly with utilisation.
- When $U \geq U_{optimal}$ the borrow interest rates increase sharply with utilisation to above 50% APY if the liquidity is fully utilised.

3.4 P2P Yield Swapping Mechanism

The yield swapping mechanism allows users to exchange their Uniswap V3 (UniV3) liquidity positions for an immediate, risk-free yield. This offers liquidity providers (LPs) the opportunity to receive upfront earnings instead of waiting for potential future returns from their liquidity pool investments.

3.4.1 How It Works?

UniV3 Position

- **Tokenization of Liquidity**: When users provide liquidity on Uniswap V3, they receive Non-Fungible Tokens (NFTs) representing their liquidity positions. These NFTs encapsulate the specifics of the liquidity position, such as the asset pair, fee tier, and the range within which the liquidity is active.

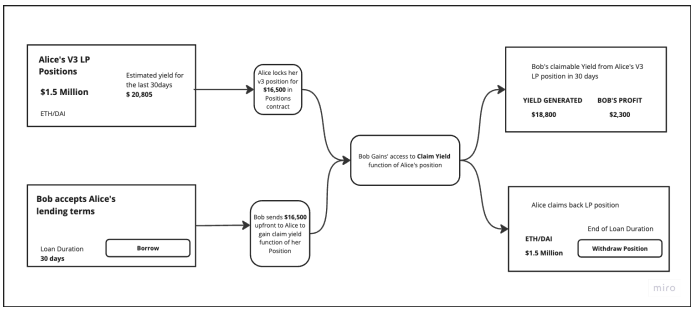

Figure 2: P2P Yield swapping

- **Integration with Positions Protocol**: Users can bring these UniV3 NFTs into the Positions Protocol. The protocol recognizes and verifies these positions, enabling them to participate in the yield swapping mechanism.

Yield Swap Swapping Process: Once a user's UniV3 position is brought into the protocol, it can be swapped for a predefined, risk-free yield. The yield swap mechanism involves the following steps:

- **Valuation**: The protocol calculates the value of the UniV3 position based on current and projected market conditions. Factors such as the liquidity range, the current price of the underlying assets, and market volatility are considered. Users can put that up for rent for the calculated predefied amount.
- **Fixed Yield Offering**: Any users can come to the protocol and offers a fixed, predetermined yield to the user in exchange for their UniV3 position. This yield is calculated to provide a risk-free return, often lower than the potential market yield but guaranteed.

Upfront Earnings

- **Immediate Return**: Instead of waiting for the liquidity position to generate earnings over time, users receive an upfront payment, providing immediate returns. This is particularly beneficial for users seeking liquidity or wishing to mitigate the risks associated with holding a volatile liquidity position.
- **Guaranteed Yield**: The yield provided is risk-free, meaning it is not subject to market fluctuations. This guaranteed yield is generally lower than the potential earnings from maintaining the liquidity position but offers certainty and security.

3.4.2 Swapping Mechanism Details

Predefined Yield Calculation

- **Market Analysis**: The yield offered is calculated based on an analysis of the current and projected market conditions. This includes assessing the potential earnings from the UniV3 position and the associated risks, such as impermanent loss and market volatility.
- **Discount Rate**: The fixed yield is typically offered at a discount to the expected market yield, reflecting the cost of providing a risk-free return and the value of immediate liquidity. The discount rate is determined by the protocol's risk assessment and market conditions.

Risk-Free Return

- **Risk Mitigation**: By swapping for a fixed yield, users eliminate the risks associated with the liquidity position, such as market volatility, price fluctuations, and impermanent loss. The risk-free nature of the return provides peace of mind to users seeking stability.
- **Yield Guarantee**: The protocol guarantees the fixed yield, which is paid out immediately to the user by the other user in the P2P way. Only after the upfront yield transfer, the other user will be able to collect fee for the respective position for a pre-defined duration.

User Profit Potential

- **Earning Differential**: Users who swap their UniV3 positions for the fixed yield receive an immediate payout. However, the counterparty in the swap (often another user or a protocol participant) may seek to earn a higher return than the upfront payment made. They effectively "rent" the NFT and take on the market risk, potentially profiting if the actual yield from the liquidity position exceeds the fixed yield paid.
- **Speculative Opportunity**: This setup creates a speculative opportunity for the counterparty, who bets on the future market performance of the liquidity position. If successful, they can achieve a higher yield than the fixed rate, capturing the difference as profit.

4 Risk Management

This risk management framework outlines measures to mitigate risks associated with the Positions Protocol, which allows users to stake Liquid Staking Tokens (LSTs) through EigenLayer and use them as collateral to borrow stablecoins. The primary risks addressed include asset devaluation, protocol security, liquidity concerns, and operational risks.

4.0.1 Whitelisted Collateral Assets

Description: Only assets from pre-approved protocols like Eigen or Karak are eligible as collateral. This ensures that only high-quality and reputable assets are accepted.

Risk Mitigation:

- **Reputation & Security**: By restricting collateral to whitelisted assets, the protocol leverages the security and credibility of established projects.
- **Regular Review**: The list of whitelisted assets will be regularly reviewed and updated based on ongoing assessments of the associated protocols' security, market performance, and governance.

4.0.2 Collateralization Ratio and Borrow Limits

Description: Users can only borrow up to 80% of the collateral value. This conservative loan-to-value (LTV) ratio minimizes the risk of liquidation due to market volatility.

Risk Mitigation:

- **Over-Collateralization**: By requiring users to maintain a buffer (i.e., only borrowing up to 80% of the collateral value), the protocol can absorb minor fluctuations in asset prices without triggering liquidations.
- **Dynamic Adjustments**: The collateralization ratio may be adjusted based on market conditions and the volatility of the underlying assets to maintain protocol stability.

4.0.3 Depeg Protection

Description: The protocol uses the value of the underlying assets rather than the total shares as collateral. This approach protects against the risk of depegging, where the value of shares might diverge from the value of the underlying assets.

Risk Mitigation:

- **Accurate Valuation**: Using the underlying asset value ensures that the collateral is accurately valued, reflecting its true market worth.
- **Continuous Monitoring**: The protocol will continuously monitor the peg status of LSTs and take corrective actions if significant deviations are detected.

4.0.4 Oracle and Price Feeds

Description: Accurate and reliable price feeds are crucial for valuing collateral and determining borrow limits. The protocol uses chainlink oracles to fetch asset prices.

Risk Mitigation:

- **Decentralized Oracles**: Utilizing decentralized oracles reduces the risk of price manipulation and ensures reliable data.
- **Fallback Mechanisms**: Implementing fallback mechanisms in case of oracle failure or discrepancies ensures continued operation and accurate pricing. Positions uses the protocol owned price oracle for fallback.

5 Conclusion

Positions Protocol represents a significant advancement in the DeFi ecosystem by addressing key challenges such as locked liquidity inefficiency, limited capital utilization, and fragmented services. By leveraging innovative mechanisms like P2P yield swapping and lending/borrowing with locked Liquid Staking Tokens (LSTs) as collateral, the protocol enhances capital efficiency, provides immediate liquidity, and guarantees predictable returns. The integrated approach simplifies the user experience, making DeFi more accessible and user-friendly. Through its commitment to empowering financial freedom, balancing risk and reward, and promoting broader adoption, Positions Protocol aims to foster a more inclusive, resilient, and dynamic financial environment. As the DeFi landscape continues to evolve, Positions Protocol is poised to play a crucial role in redefining liquidity management and promoting sustainable growth in the decentralized finance space.