

Sharpe Earn: A Technical Whitepaper

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Abstract

Sharpe Earn is a comprehensive platform that leverages advanced automation to simplify the management of investment positions in the DeFi space. It enables users to effortlessly earn yields in a self-custodial environment where the positions and strategies are created in the user's wallets instead of vaults.

1 Introduction

Sharpe Earn serves as a gateway to effortless earnings in the DeFi space. It offers a safe and easy way to manage, track, invest, and automate DeFi assets using any wallet. The platform positions itself as a versatile and user-friendly platform, catering to a wide range of needs from basic asset management to sophisticated investment strategies in the DeFi space.

2 Terminology

DeFi: Decentralized Finance. An umbrella term for financial services on blockchain, primarily Ethereum, with no central authority.

Smart Account: A contract that is both created and owned solely by the user, with all management responsibilities resting solely in the user's hands.

Assembly: A set of Defi transactions that are grouped together and executed in one order.

Defi transaction: A contract designed to execute a particular defi transaction, such as Aave supply, DEX swap, etc.

Sharpe Earn Registry contract: A central registry for managing contract addresses within the Earn smart contract ecosystem.

Proxy Registry Contract: A contract used in the Sharpe Earn smart contract ecosystem to manage and deploy proxy instances.

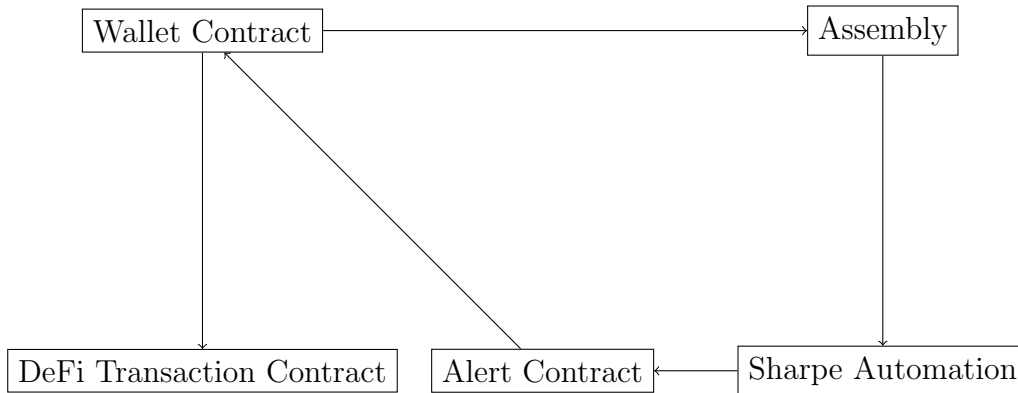


Figure 1: Sharpe Earn Architecture

3 Key Features

- **Institutional-Grade, Self-Custodial DeFi:** Focuses on earning high yields in DeFi securely.
- **Simplified DeFi Strategies:** Offers a one-click solution for investing in optimal yield DeFi strategies.
- **Boosted Earnings:** Unlocks higher yield potentials across various protocols and chains.
- **Full Control and Custody:** Ensures users maintain complete control over their funds through self-managed vaults.
- **Customizable Strategies:** Provides tools for dynamic adjustment to market conditions.
- **Verifiable and Transparent:** Offers Onchain-verifiable processes for transparency and peace of mind.

- **Adjustable Leverage:** Enables boosting of earnings in DeFi with adjustable leverage options.
- **Access to Blue-Chip Protocols:** Allows investments in top-tier DeFi protocols like AAVE, Morpho, Lido, and Rocketpool.
- **Automated Yield Management:** Automates the management of positions for effortless yield generation.
- **Worldwide Wallet Adaptability:** Offers universal wallet integration for asset management.

4 Use Cases

- **DeFi Portfolio Management:** Ideal for users seeking to manage and optimize their DeFi investments with enhanced security and control.
- **Yield Maximization:** Suitable for those looking to leverage advanced strategies for higher returns in DeFi.
- **Strategic Investment in DeFi:** Beneficial for investors seeking easy access to top-tier DeFi protocols and customizable strategies.
- **Automated DeFi Engagement:** Perfect for individuals who prefer an automated, hassle-free approach to managing their DeFi positions.

5 Architecture

5.1 Wallet Contract

The Wallet Contract is a central element of the Sharpe Earn architecture. It provides users with a personalized, secure, and flexible solution for managing their DeFi transactions. Users retain full control and ownership over the Wallet Contract, ensuring they maintain exclusive management rights. The Wallet Contract consolidates multiple DeFi transactions into a single, unified transaction, a feature not available when using an Ethereum account (Externally Owned Account, or EOA) alone.



Figure 2: Wallet Contract Flow

5.1.1 Wallet Contract Flow

- **Creation:** The Wallet Contract creation process is initiated by the user through the Wallet Registry.
- **Deployment:** A new Wallet Contract is deployed on the blockchain. The contract owner is set to the address of the user who initiated the creation (msg.sender). This information is then stored in the Wallet Registry Contract.
- **DeFi Transactions:** All subsequent DeFi transactions are executed via the Wallet Contract. This process requires two inputs: the address of the Assembly Contract and the call data specifying the target DeFi contract's function to execute.

5.2 Assembly

An Assembly is a collection of DeFi transactions that are grouped and executed sequentially in a specific order. These transactions are designed to work in tandem, with the ability to share return values that can be utilized as inputs for subsequent transactions within the Assembly.

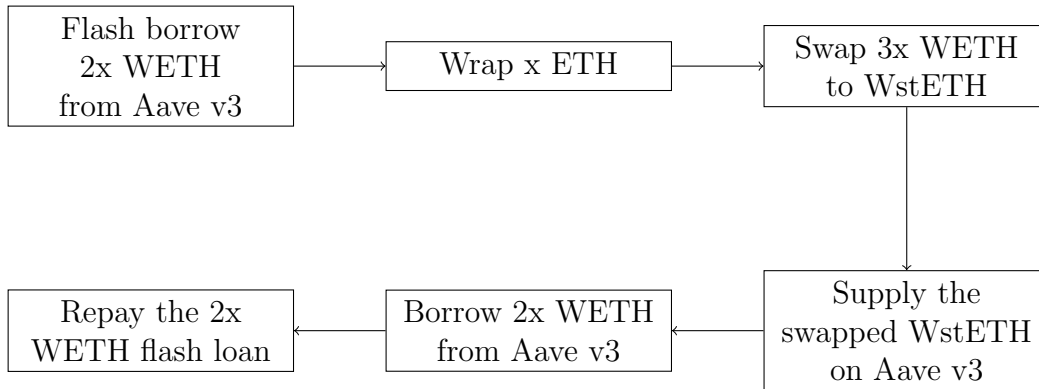


Figure 3: Assembly Execution Flow

5.2.1 Example

Consider a user who wants to create a 3x leveraged wrapped staked Ether (WstETH) position on Aave v3. They can create an Assembly that encompasses all required transactions to achieve this position in a single, unified transaction. The following DeFi transactions must be executed in sequence to create a 3x leveraged WstETH position on Aave v3:

- Flash borrow 2x WETH from Aave v3
- Wrap x ETH
- Swap 3x WETH to WstETH
- Activate Aave v3 E-mode
- Supply the swapped WstETH on Aave v3
- Borrow 2x WETH from Aave v3
- Repay the 2x WETH flash loan

These DeFi transactions are grouped and executed sequentially via the AssemblyExecutor contract, allowing the user to efficiently create an Assembly of DeFi transactions and execute them in a single transaction.

5.3 Sharpe Automation

Sharpe Automation is an innovative feature that enhances the efficiency and responsiveness of the DeFi management experience. By leveraging the power of smart contracts, Sharpe Automation allows users to execute Assemblies automatically based on specific pre-defined conditions. This can be thought of as a customizable if-this-then-that mechanism for DeFi transactions.

5.3.1 Automation Components

- **Array of Alerts:** These are the pre-defined conditions that must be satisfied for the Automation to trigger. Alerts are monitored through Alert Contracts, which check whether the conditions have been met.
- **Assembly:** A sequence of DeFi transactions that is executed when all specified alert conditions are satisfied.

Chainlink bots play a crucial role in executing automation by continuously monitoring the alert conditions and triggering the associated Assembly when the conditions are met.

5.4 Alert Contract

The Alert Contract is a pivotal component within the Sharpe Earn ecosystem, designed to monitor and verify if specific conditions have been fulfilled. Acting as a vigilant sentinel, Alert Contracts play a crucial role in enabling Sharpe Automation to function effectively and responsively, allowing users to automate their DeFi management experience based on pre-defined criteria.

5.5 DeFi Transaction Contract

The DeFi Transaction Contract is a vital component in the Sharpe Earn architecture, engineered to streamline and optimize the execution of individual DeFi transactions. By providing a modular and flexible solution, DeFi Transaction Contracts enable seamless integration with other elements of the Sharpe Earn ecosystem, ensuring a smooth and efficient UX for the end user.

6 Core Parts of Sharpe Earn

- **Smart Account:** The Smart Account (DSProxy) is both created and owned solely by the user, with all management responsibilities resting solely in the user's hands. This ensures that the user maintains complete ownership of the contract at all times. By utilizing a Smart Account, it becomes possible to combine multiple transactions for decentralized finance (defi) operations into a single transaction. This is not achievable when relying solely on an Ethereum account, also known as an Externally Owned Account (EOA).
- **Assembly:** An Assembly is a set of Defi transactions that are grouped together and executed in one order. These transactions are designed to work together and can even share return values, which can then be used as inputs for subsequent transactions within the Assembly.
- **Defi transaction:** This contract is designed to execute a particular defi transaction, such as Aave supply, DEX swap, etc. These Defi trans-

actions are implemented as logic contracts that are invoked via a Smart Account and do not hold any state.

- **Sharpe Earn Registry contract:** The Sharpe Earn Registry contract serves as a central registry for managing contract addresses within the Earn smart contract ecosystem. This contract is designed to provide flexibility and timelock mechanisms for managing contract changes, enhancing the security and reliability of the smart contract ecosystem.
- **Proxy Registry Contract:** The ProxyRegistry contract is used in the Sharpe Earn smart contract ecosystem to manage and deploy proxy instances (specifically, Smart Account). These proxy instances can be associated with different users or owners, and the ProxyRegistry contract keeps track of these associations.

Conclusion

Sharpe Earn is not just a platform, but a vision for a reimagined DeFi landscape. It advocates for a horizontal DeFi model where users maintain control of their funds on base protocols, as opposed to the prevalent vertical DeFi model where protocols are built on top of one another. This shift reduces security risks and enhances decentralization, aligning with the core principles of blockchain technology.

Sharpe Earn is poised to revolutionize the way users interact with DeFi. By building the frontend for DeFi, it simplifies the management of investment positions, enabling users to effortlessly earn yields in a self-custodial environment. The platform's innovative architecture and user-friendly features cater to a wide range of needs, from basic asset management to sophisticated investment strategies.

In essence, Sharpe Earn is more than a comprehensive platform—it's a gateway to effortless earnings in the DeFi space. It offers a safe and easy way to manage, track, invest, and automate DeFi assets using any wallet. With its commitment to security, transparency, and user control, Sharpe Earn is set to redefine the DeFi experience and lead the way towards a more accessible and decentralized financial future.

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