

Teal DEX Litepaper

Introduction

Teal is a one synchronous DeFi protocol on Algorand, a combination of Automated Market Maker (AMM), Yield Farming Accelerator, and Bridge, working as a core Algorand ecosystem enabler.

Teal DEX smart contracts will be live on Algorand. Anyone can interact with them directly or through Teal's interface.

About Algorand

Algorand uses a protocol called pure proof-of-stake (PPoS).

Algorand seeks to solve the Blockchain trilemma. This entails creating a balance between the following three elements:

- Decentralization: the network should not rely on a single point of control
- Scalability: the blockchain should scale to accommodate a large number of users
- Security: the system should be resilient to bugs, malicious attacks, and other problems

Exchange

Teal DEX is an Algorand-based Automated Market Maker (AMM).

In the early stage, Teal's structure is similar to Uniswap v2 that utilizes the constant product formula:

$$T\alpha T\beta = k$$

where $C\alpha$ and $C\beta$ represent the number of tokens in reserve, and k is the constant product.

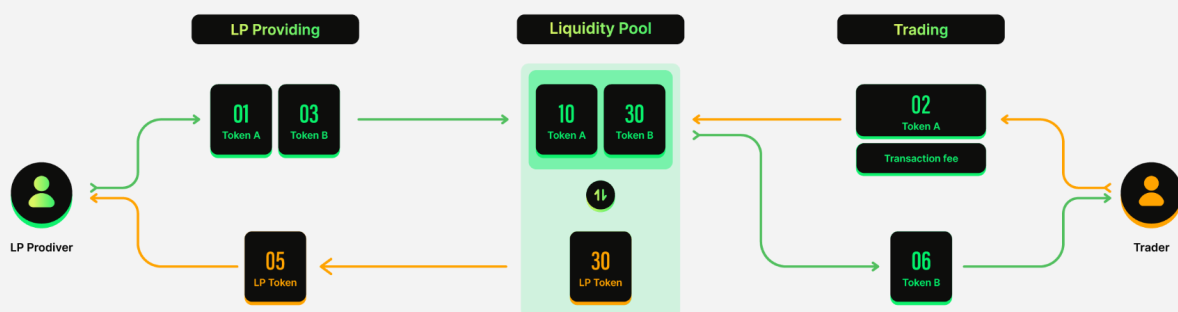
During a transaction trading $\Delta\beta$ amount of β for $\Delta\alpha$ amount of α , with a percentage fee of $(1 - \gamma)$, it must satisfy $(T\alpha - \Delta\alpha)(T\beta + \gamma\Delta\beta) = k$. Therefore, the reserves would be updated as such: $T\alpha \rightarrow T\alpha - \Delta\alpha$, $T\beta \rightarrow T\beta + \Delta\beta$, and $k \rightarrow (T\alpha - \Delta\alpha)(T\beta + \Delta\beta)$

Teal charges a 0.30% fee on trades, which is partially added to reserves. As a result, each transaction made on Teal adds to k . The 0.30% trading fee is broken down as follows:

0.25% - Paid to liquidity pools in the form of a trading fee for liquidity providers.

0.05% - sent to the staking pool and acts as a reward for those staking their \$TDEX tokens.

Depending on the priority of each period, the fee structure could be changed.



The Teal Exchange provides multiple features supporting decentralized trading on Algorand:

Swap

Swap is the easiest way a user can exchange any Algo-tokens with another. For users, all they need to do is to select an input token and an output token, select the amount for the swap, and execute the transaction. Swap is user-friendly and safe because

- Instantly - Users can instantly swap Algo-tokens without registration.
- Decentralized - Users trade directly with wallet add-ons to maintain complete ownership over their crypto assets. Teal does not hold users' funds.

If two Algo-tokens are not paired directly, they can still be swapped as long as a path between them exists. Best-price swap contracts are used to optimize multi-step swaps.

Order book

To encourage users who are familiar with the order book of centralized exchanges and hesitant about decentralized exchanges, Teal offers a quality trading experience with powerful trading tools.

Users who are familiar with order books and charts can:

- View the price chart of the pair
- Submit an order to the order book
- Retrieve orders from the order book
- Cancel an order in the shared order book
- Create a trade using one or more orders from the order book.

Liquidity Providing

Each liquidity pool acts as a marketplace for trading a pair of Algo-tokens. When a pool contract is formed, its token balances are 0. For the traders to begin trading, it must be deposited with an initial amount of each token. This first liquidity provider establishes the pool's starting pricing. They are rewarded for contributing an equal amount of both tokens to the pool.

Once the liquidity pool is created, anyone can participate in a pool as a liquidity provider (LP) by depositing an equal amount of each underlying token in exchange for pool tokens. These tokens correspond to pro-rata LP shares of the total reserves and could be redeemed at any time for the underlying assets.

For example, if you deposited TDEX and ALGO into a Liquidity Pool, you will get TDEX-ALGO LP tokens. These tokens represent your portion of the TDEX-ALGO Liquidity Pool.

Liquidity Providers can earn trading fees. People trading the pair (using the liquidity pool) pay a 0.3% fee, of which 0.25% is added to the Liquidity Pool.

Yield Farming

Teal enables users to start yield farming, creates an efficient liquidity-providing environment, and opens up several use cases, such as lending diverse tokens.

Besides the rewards from providing liquidity, farmers also receive farm rewards, whose value depends on the total amount of reward distributed to the farm and the total LP tokens in the farm.

As a yield farming protocol, Teal offers:

- A governable treasury to add additional support and stability for Teal farm.
- Fully on-chain governance to allow decentralized control and evolution from Day 1.
- An equal distribution mechanism incentivizes crucial community members to actively take the reins of government.

Staking

Teal DEX is the base layer protocol for decentralized and trustless staking, where you can stake your tokens to earn rewards, including TDEX or other tokens.

Unlike Yield Farming, Staking requires only one token, usually TDEX, to start and does not come with the risk of Impermanent Loss.

Besides common staking pools, Teal DEX offers a wide range of advanced staking options that provide more financial benefits to stakers.

Staking booster - bTDEX

bTDEX is a staking option that incentivizes long-term stakers with boosted Yield Farm reward. Stakers participating in bTDEX receive bTDEX that can be used to increase the APR from select farms.

For boosted farms, there is a fixed amount of reward shared among non-boosted stakers and boosted stakers (bTDEX holders). Farmers with bTDEX can access the Boost Reward Pool. The higher your bTDEX share, the higher your share of the Boost Rewards.

Teal DEX Bridge

As a gateway to Algorand, Teal offers a bridge solution that allows users from Ethereum blockchains and Solana to migrate their assets, including tokens and NFTs, to Algorand at speed. Using decentralized wallets such as Metamask, Phantom, or other Web3 wallets, users can send assets directly to Algorand wallets and apps, and vice versa.

Future Developments

More enhancements to the initial ideas of the protocols are being detailed and will be updated the future whitepapers:

- Token utilities
- Apply Concentrated Liquidity to the AMM smart contract to improve capital efficiency for liquidity
- Mechanisms to improve the order book
- Mechanisms to increase throughput
- Tools to provide secondary derivative markets
- More advanced staking options
- Features using token burning mechanism

Conclusion

The approach above provides a basic yet scalable and expandable solution to the current needs of the Algorand blockchain. It also prepares Teal for future expansion into more efficient and advanced protocols within the Algorand ecosystem.

References

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