

Mooniswap V2 (legacy)

08 Dec 2020 Documentation moved to Mooniswap V2 - Architecture Documentation

Introduction

In August 2020 1inch released its first AMM called Mooniswap. Mooniswap is a constant-product AMM with the addition of virtual balances. Virtual balances were introduced to redirect some arbitrageur profits to liquidity providers. More details about Mooniswap can be found in the whitepaper and this doc will focus on changes introduced in Mooniswap V2.

High level overview of changes in Mooniswap V2:

- **governance** mechanism to decide optimal pools configuration parameters
- new mechanism of **referral fee distribution**
- new **slippage fee**
- new **governance fee**

Fees

For simplicity we will start by describing the new fees introduced in Mooniswap V2:

Slippage fee

Slippage fee is charged on top of the basic fee and is proportional to the slippage caused by trade. Slippage fee calculation is the following:

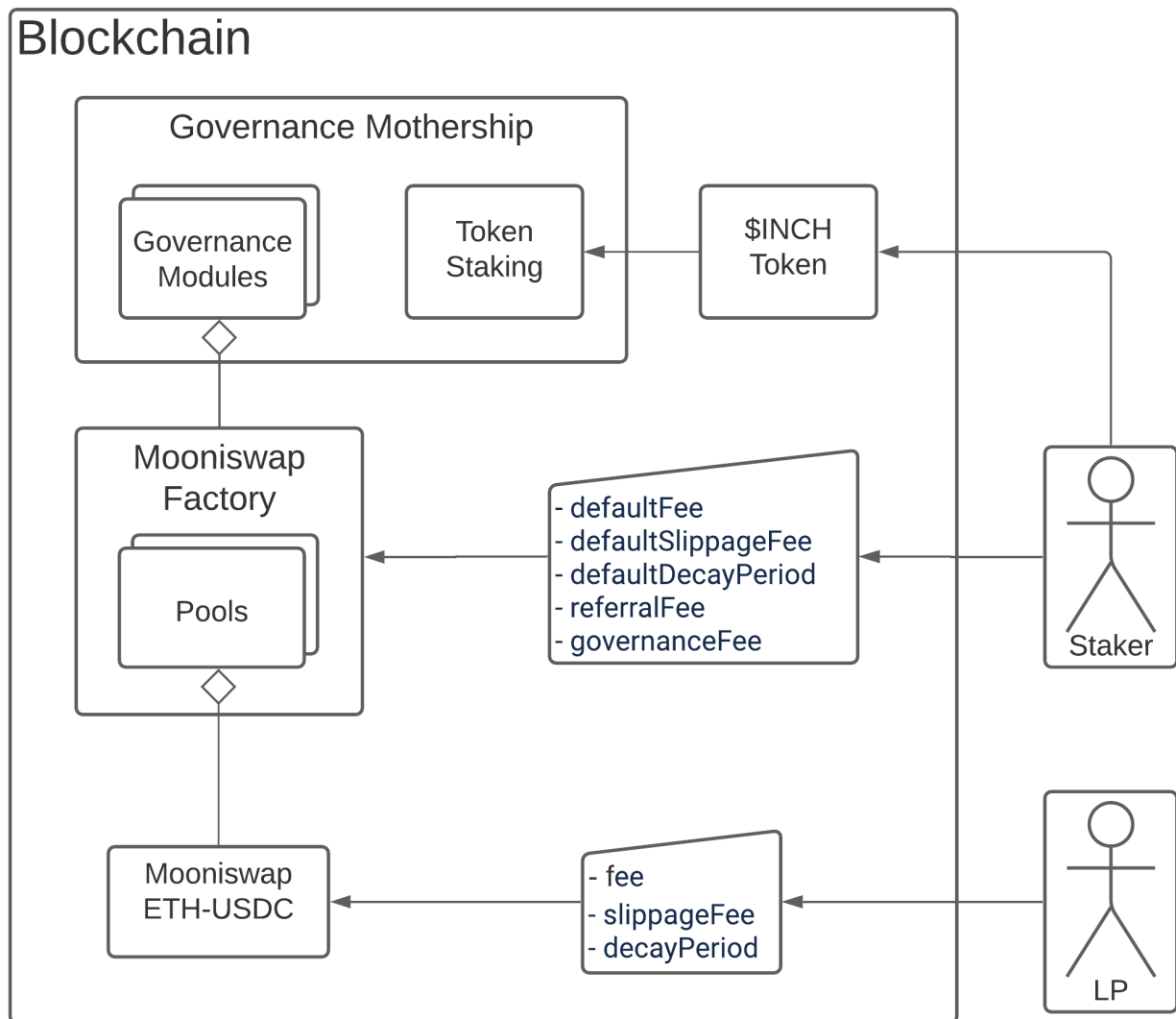
```
x = src_token_balance
y = dst_token_balance
dx = src_token_amount
// we assume that input_fee is 0, otherwise consider
// dx = src_token_amount * (1 - input_fee)

spot_price = y / x
spot_return = dx * spot_price
              = dx * y / x
amm_return = dx * y / (x + dx)
slippage = (spot_return - amm_return) / spot_return
           = (dx * y / x - dx * y / (x + dx)) / (dx * y / x)
           = dx * dx * y / (x * (x + dx)) / (dx * y / x)
           = dx / (x + dx)
final_return = amm_return * (1 - slippage_fee * slippage)
              = dx * y / (x + dx) * (1 - slippage_fee * dx / (x + dx))
              = dx * y / (x + dx) * (x + dx - slippage_fee * dx) / (x +
dx)
```

Governance fee

Governance fee is introduced to reward users for their effort of managing Mooniswap parameters. It is charged the same way as referral fee by minting some amount of pool shares representing the percentage of profit of the pool made from trade.

Governance



Mooniswap V2 introducing the configuration of all the pool parameters via governance. We call our governance model Liquid Governance. In this model user's vote is slowly applied over a fixed time period (1 day) and final value is determined as weighted average of all the votes with weights equal to users' share of voting tokens. Governance is split into two parts — Pool governance and Factory governance.

Pool governance allows configuration of parameters that are specific to each pool — **fee**, **slippageFee** and **decayPeriod**. Each liquidity provider can vote for values of these parameters using their LP-tokens. The more liquidity user provides, the more significant their vote becomes.

Factory governance allows configuration parameters that are shared between all the pools — **defaultFee**, **defaultSlippageFee**, **defaultDecayPeriod**, **referralFee** and **governanceFee**. Parameters with default- prefix are used as default votes for those liquidity providers who do not participate in Pool governance. **referralFee** and **governanceFee** just set corresponding fees. 1INCH token holders can stake their tokens in GovernanceMothership to participate in Factory governance with the weight of their vote being equal to their share of total tokens staked.

Pool governance

This parameters are specific for each pool. Voting happens in each pool separately using the LP-tokens of the pool. If liquidity provider does not vote, default value from the factory will be used for his share.

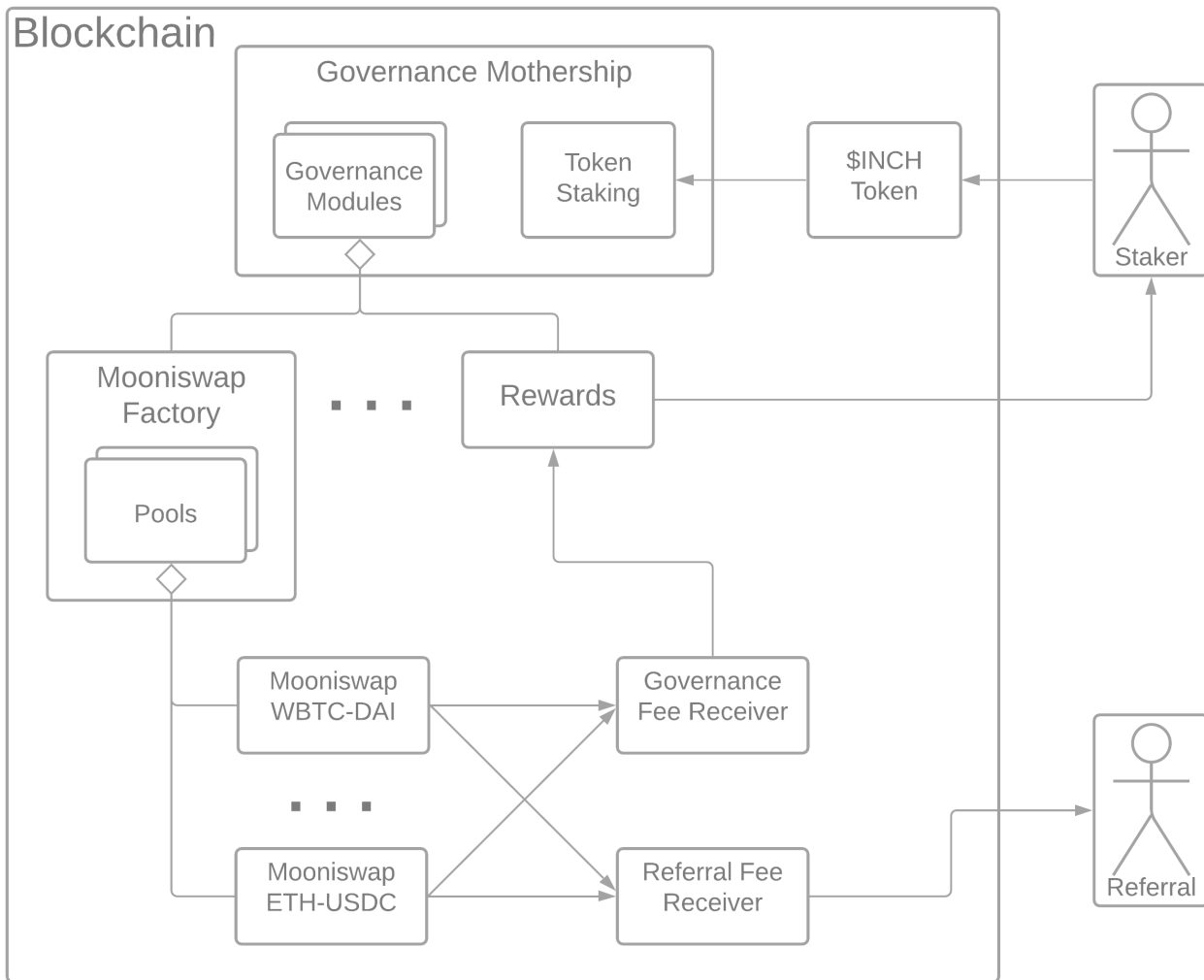
- **fee** [0% .. 10%] — input fee that is charged on input value of each trade
- **slippageFee** [0% .. 100%] — fee that is charged as an extra portion of slippage on each trade
- **decayPeriod** [15 sec .. 1 hour] — period over which virtual balances converge to the real balances

Factory governance

This parameters are shared between all the pools. Voting happens in factory by staking 1INCH tokens in the GovernanceMothership contract. If staker does not vote predefined constants are used as defaults.

- **defaultFee** [0% .. 10%, default = 0%] — default value for fee in Mooniswap pools
- **defaultSlippageFee** [0% .. 100%, default = 10%] — default value for slippageFee in Mooniswap pools
- **defaultDecayPeriod** [15 sec .. 1 hour, default = 5 min] — default value for decayPeriod in Mooniswap pools
- **referralShare** [0.01% .. 25%, default = 5%] — percentage from pool income that goes to referral
- **governanceShare** [0% .. 25%, default = 0%] — percentage from pool income that goes to 1INCH token stakers

Fee distribution



Referral fee distribution

In Mooniswap V1 we rewarded referrals directly minting them shares of the pools. This shares then needed to be unwrapped for the underlying tokens and probably swapped to some other tokens. The mechanism is inefficient as it requires two trades per each pool per each user. We decided to improve that mechanism and now we aggregate all the referral rewards on one contract which then unwraps and sells underlying tokens for 1INCH token for all the referrals at once. Referrals are then able to claim their share of 1INCH token for all the pools that they were rewarded in one gas efficient claim transaction.

Governance fee distribution

As governance fee is charged the same way that referral fee is charged it is also distributed in a similar manner. All the governance rewards in form of pool shares are minted to the smart contract which then unwraps them and sells underlying tokens for 1INCH token. Obtained 1INCH token is then distributed over the course of one week among those who staked 1INCH token in GovernanceMothership proportionally to their stakes.