

# Multiple Protocol

WhitePaper

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### Multiple Protocol

This Whitepaper introduces the Multiple Protocol core contracts including the storage of liquidity providers' funds, the liquidity pool, and the algorithmic contract mechanism for LP management.

### 1.Introduction

#### Abstract

Multiple Finance is a Decentralized Finance (DeFi) protocol based on Ethereum that allows expert traders (GP) to provide professional AMM liquidity strategies which in turn ensures users (LP) securely benefit from the best yielding products.

#### 1.1 Project Background

With the popularization of digital assets, demand for DeFi continues to grow and its market size expand, bringing explosive growth to the whole space. Multiple Finance re-constructs investor relations in the centralized financial world by bridging GPs and LPs with smart contracts that enable them to connect and share mutual trust.

Funds are a common financial instrument with the first-ever money market fund being created in 1972. Since then, investors have largely relied on different investment portfolio strategies to hedge risk.

Money market funds ensure stable and controllable risk exposure in a portfolio. If one asset outperforms or underperforms, there is an option to sell or buy in order to maintain the asset's share in the portfolio's overall value.

Whether it is in the traditional financial system or the blockchain space, money market fund portfolio managers charge investors a service fee that is primarily used to cover the costs of portfolio rebalancing. The portfolios, however, are normally managed in a centralized manner which inevitably results in underlying custodial risk. Multiple Protocol is an automated market maker (AMM) with certain key attributes that enables it to be used as a tool for portfolio risk control and investment return maximization.

## 1.2 Multiple and Uniswap v3

Uniswap v3 introduces concentrated liquidity with granular control over prices, multiple fee layers, range orders, and an advanced TWAP oracle, all of which make Uniswap v3 the most flexible and efficient AMM yet.

Multiple Protocol offers an elegant enhancement of new Uniswap v3 features from the following angles:

### (1) Concentrated Liquidity

In Uniswap v3, LPs can concentrate their capital within custom price ranges, providing greater amounts of liquidity at desired prices. In doing so, LPs construct individualized price curves that reflect their own preferences and combine any number of positions within a single pool. For example: an LP in the ETH/DAI pool may choose to allocate \$100 to the price range \$1,000 - \$2,000 and an additional \$50 to the \$1,500-\$1,750 range. By doing so, an LP resembles an automated market maker or active order book. Users can

trade against the combined liquidity of all individual curves with no gas cost increase. Trading fees collected at given price ranges are split pro-rata by LPs proportional to the amount of liquidity each contributed to that range.

## (2) Capital Efficiency

By concentrating their liquidity, LPs can provide the same liquidity depth as v2 within specified price ranges while reducing risk. The capital saved can be held externally, invested in different assets, deposited elsewhere in DeFi, or used to increase exposure within the specified price range to earn more trading fees.

After the launch of Uniswap v3, capital gains will max out at 4,000x for LPs providing liquidity within a single 0.10% price range. Pools in v3 are technically capable of supporting ranges as small as 0.02% and allow for a maximum 20,000x capital gain versus v2. These pools with smaller ranges, however, require increased gas costs and therefore might benefit from using a Layer 2 solution.

## (3) Active Liquidity

If the market price moves outside an LP's set price range, their liquidity is effectively removed from the pool and is no longer earning fees. In this state, an LP's liquidity is composed entirely of the less valuable of the two assets until the price moves back to within the price range or they decide to update the range to account for current prices.

## (4) Range Orders

LP customizability on Uniswap v3 opens up a new order feature to complement market orders called "range orders".

LPs can deposit a single token in a custom price range above or below the current price: if the market price enters into their specified range, they sell one asset for another along

a smooth curve while earning swap fees in the process. Range orders within wider ranges may prove particularly useful for profit-taking, buying the dip, and primary issuance events: in the later use case, issuers are now able to deposit liquidity in a single asset and specify the exact range of prices across which they wish to sell their tokens.

#### (5) Non-Fungible Liquidity

As a byproduct of per-LP custom price curves, liquidity positions are no longer fungible and are not represented as ERC20 tokens in the core protocol. Instead, LP positions will be represented by non-fungible tokens (NFTs). However, common shared positions can be made fungible (ERC20) via peripheral contracts or through other partner protocols. Additionally, trading fees are no longer automatically reinvested back into the pool on LPs' behalf.

We can conclude from the above that Uniswap v3 has elevated the technological threshold to providing liquidity. Compared to v2, v3 requires investors to spend more time and effort analyzing complicated investment strategies to ensure optimal returns. Multiple Protocol simplifies the investment process by freeing LPs from the tedious task of price setting and adjustment. All that is needed is to allocate the assets, deposit single assets, and then let a professional GP launch market-making strategies to generate high returns. In the future, we anticipate the tokenization of complex investment strategies which may include long positions, automated re-balancing, fee reinvestment, and lending, etc.

### 1.3 Core Values of Multiple

Multiple Protocol revolutionizes the traditional concept of money market funds; instead of paying an investment manager to re-balance your portfolio, users are matched directly by smart contract to a trader (GP) who, with their professional skills, offers liquidity strategies to maximize investment performance. In addition, the strategy monitoring protocol guarantees the security of the funds. The goal of Multiple Protocol is to concentrate liquidity for small-volume LPs and allow them to enjoy ROI that could only be achieved by large holders.

## 2. Multiple Protocol

### 2.1 Deposit Pool

The deposit sharing pool works as a yield aggregator that is committed to always achieving the highest yield from the supported tokens. The pool runs a deposit protocol through smart contracts on the Ethereum blockchain. Multiple Finance allows anyone to obtain tokens from the asset pool after depositing a single asset as long as the specific token is provided in the pool.

LPs can deposit or withdraw a single asset conveniently using the Multiple.finance Pool to gain an optimal interest rate.

The deposit or withdrawal of a single asset will follow a real-time interest rate standard.

### 2.2 Liquidity

GPs provide strategies that enables liquidity. Once a user becomes a qualified GP, they can make a market using funds that are allocated to them by smart contract. When a GP withdraws from a market-making strategy, they receive rewards based on the bonus ratio of their current level. The additional yield obtained from these strategies will be given to liquidity providers staked in the asset pool.

The smart contract will assess the strategies provided by a GP in real time and GPs with a high rate of yield will be promoted to higher levels, granting them more fund allocation and higher bonus ratios. Contrastingly, a GP with a consistently poor rate of yield will be downgraded.

## 2.3 Governance

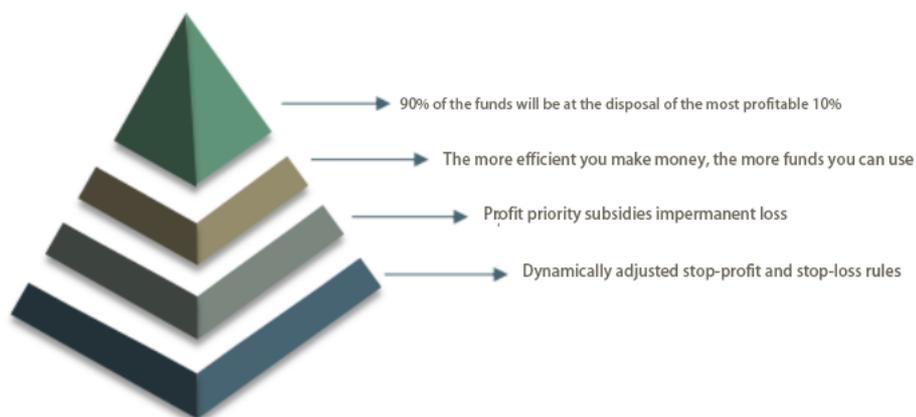
In the initial stages, an unimposing governance structure based primarily on Compound will be adopted for MUL in order to engage more MUL holders in the governance system; this method will emphasize usability and universality.

Community members will be able to make proposals and participate in governance using MUL. Participants will also earn incentives for themselves for continuously improving the system and boosting development, innovation, and sustainable growth of the community.

## 3. Product Architecture (Technical Structure and Algorithm)

### 3.1 A New Consensus Algorithm (Proof of Profitability)

With an increasing number of DeFi projects emerging on the market, we have observed that funds tend to accumulate around DeFi ecosystems that promise relatively high yields with satisfactory security policies. The phenomenon has inspired a brand-new consensus model—Proof of Profitability, an approach to proving an ecosystem’s profitability through decentralization of the smart contract. We have designed a whole system to ensure that every role involved in the consensus model has ample motivation and confidence to participate.



### 3.2 NFT as Work Permit

The 'Work Permit' is an NFT Token given to each user within the system that can only be transferred under limited circumstances. The Permit records investment performance and is used in determining Proof of Profitability. Holders enjoy differing access limits to funds, stop-loss windows, and at certain levels will also be eligible for MUL Token airdrops that occur from time to time.

The Work Permits will be generated automatically based on fund usage and earnings performance in the system following the rules as below:

$$D(n) = \begin{cases} 0, & n \leq \alpha \\ \beta \times p, & n > \alpha \end{cases}$$

The platform will automatically revoke Work Permits from holders whose operation performance is less than satisfactory.

The newly generated Work Permits will be first assigned to users that stake the largest number of MUL.

### 3.3 LP and GP

We adopt the model of a fund manager (since there are many similarities in nature between us) and determine the two roles on the platform: LP and GP — fund providers and investment managers respectively. An LP is a provider of funds to whom the platform will automatically issue LP Tokens as investment certificates that can be either staked to obtain yield, or transferred to avoid misappropriation of the fund pool. In addition, LPs willing to provide funds for a long time will receive incentives in the form of platform tokens and, aside from LP rewards, will also share in the profits of the platform tokens.

If an investment manager adds liquidity to Uniswap v3 using the disposable funds, they must pay the required gas fee. When these funds generate yield, the manager can share in part of the GP profit. As the profit increases, the amount of disposable funds also rises

due to the formula for the amount of disposable funds below:

$$A = \text{InitialAmount} + \text{AmountEarned}_{acc} \times \frac{APY}{MaxAPY}$$

### 3.4 Interestless and Collateralless

As a pioneer in the DeFi space, Multiple has taken the lead in providing a partnership model that is interest-free and collateral-free. We firmly believe that this model works in ideal combination with the Proof of Profitability consensus as it is centered around earning profit by providing liquidity on Uniswap v3.

We hope that the interest-free and collateral-free partnership model, combined with our Proof of Profitability consensus, can attract outstanding GPs to join the ecosystem and build a sustainably profitable economic model with our LPs.

In practice, GP Work Permit holders can provide liquidity to designated trading pairs on Uniswap v3 using some of the funds without paying interest or collateral. The liquidity provided under these circumstances shall not exceed +/- x%. As the price of a trading pairs changes, users can modify the position of their funds at any time to maximize profit.

### 3.5 How We Achieve Risk-Free

Assuming that the investment behavior of all GPs leads to losses, the funds available for GP use will soon reach a stop-loss limit and trigger a limiting of funding for investment. At

this point, a smart contract will be triggered to issue additional GP Work Permits and bring in new GPs until the existing GPs start making profits. This process will enable fund utilization rates to gradually increase, during which time the previous GP Work Permits will be revoked and new profits will be used to pay for the losses before they can be allocated as profit.

When the fund utilization rate is less than  $y\%$ , funds in the pool will be provided to Compound to gain interest through lending. When the fund utilization rate is over  $y\%$ , the funds on Compound will be withdrawn to the pool so that GPs can use the funds to make profits.

### 3.6 Uniswap v3 Integration

Previously, when using Uniswap v2, all LP funds were combined to provide liquidity at all price ranges, meaning that profit was solely determined by the amount of liquidity. Uniswap v3 now introduces the concept of providing liquidity to specific price ranges, thus increasing the technical demand in considering exactly how much should be used to provide liquidity within certain price ranges. This requires not only close attention to market prices but also a diversified strategy to maximize the rate of return.

The Multiple platform introduces the role of an investment manager, GP, to attract different types of investors. Many will vary in opinions on different trading pairs, levels of understanding of the market, and amount of funds available but all investors, regardless of experience, pursue the same goal of wanting to maximize returns.

As Uniswap v3 draws near, we firmly believe that the new form of consensus created by Multiple can bring brand-new opportunities and challenges to the DeFi ecosystem.

### 3.7 Future Technology Roadmaps

The technical part of Multiple will be constructed in three phases:

#### **Phase One: Initiation (Q2 2021)**

1. Enable LPs to gain yield through depositing and withdrawing multiple tokens.
2. Airdrop GP Work Permits to the addresses designated by seed investors.
3. Integrate with Uniswap v3's liquidity pool and launch the liquidity pool for USDC/ETH and DAI/ETH pairs.
4. Launch the MUL staking pool.
5. Launch the upgraded system of GP Work Permits.

#### **Phase Two: Expansion (Q1 2022)**

Once this new consensus model is recognized by the industry, we will work on developing other similar investment businesses.

1. Launch the Uniswap v3-based Margin Trading function.  
Expected to support USDC/ETH, DAI/ETH, and USDT/ETH pairs.
2. Launch the automatic depositing of unused funds to the Compound fund pool to earn interest function.
3. Enable adding liquidity to SushiSwap's Pool 1 and the mining function of Pool 2.

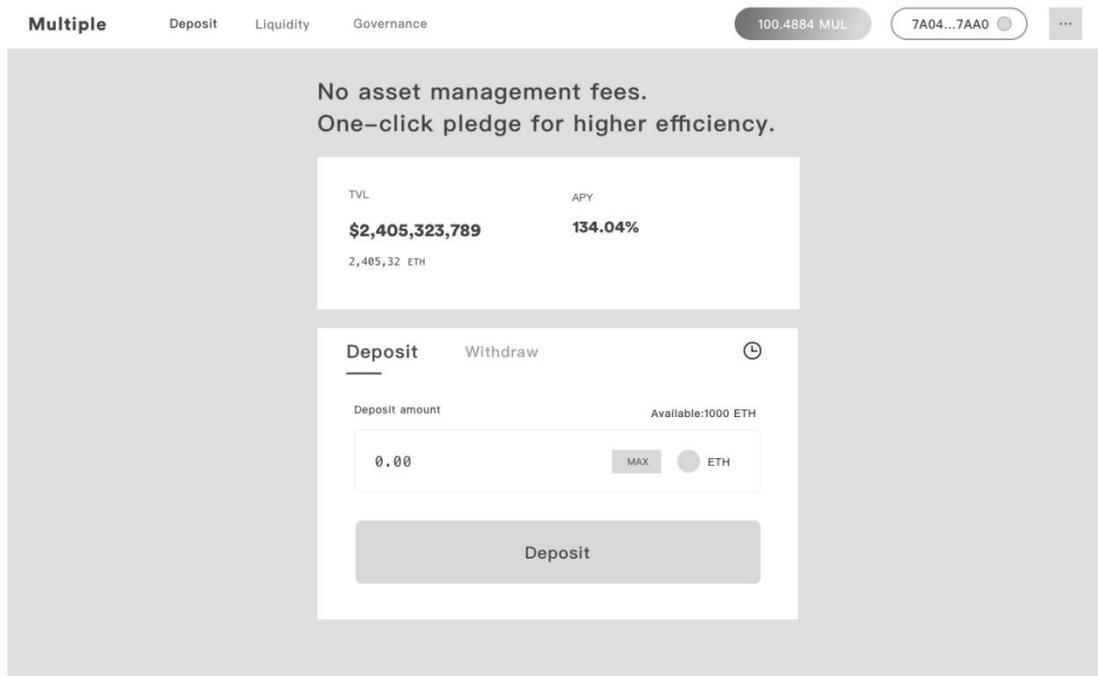
#### **Phase Three: Enhancement (Q4 2022)**

1. Launch the Governance system and enable decentralized governance of fund management.

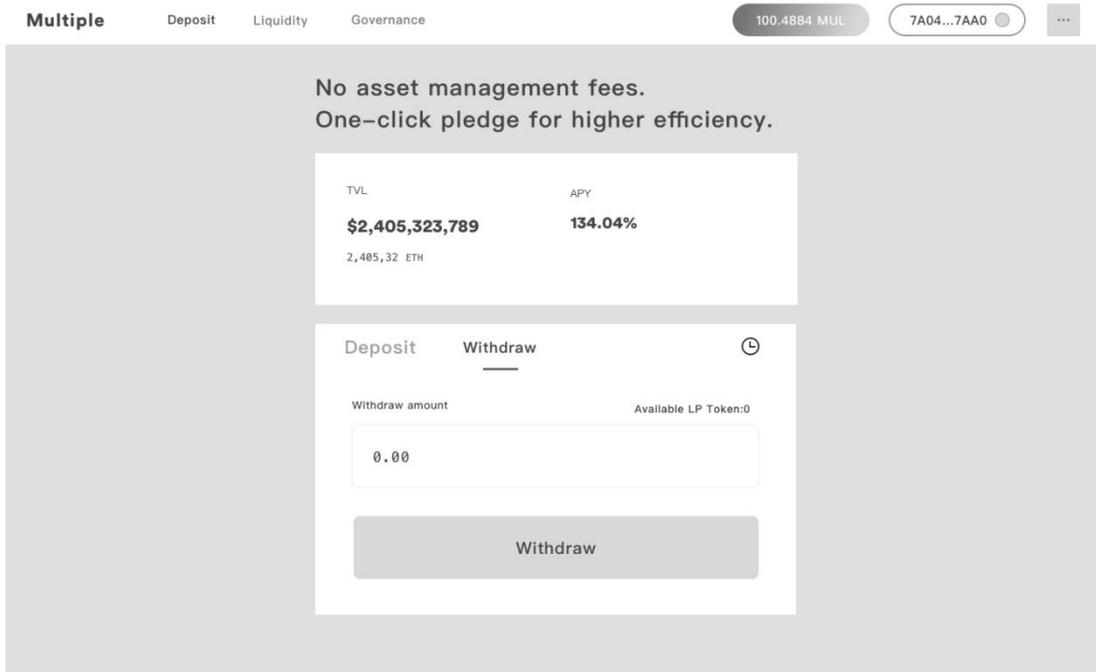
2. Initiate MUL buyback plan (Specific strategies still pending discussion).

## 4. Protocol Prototype

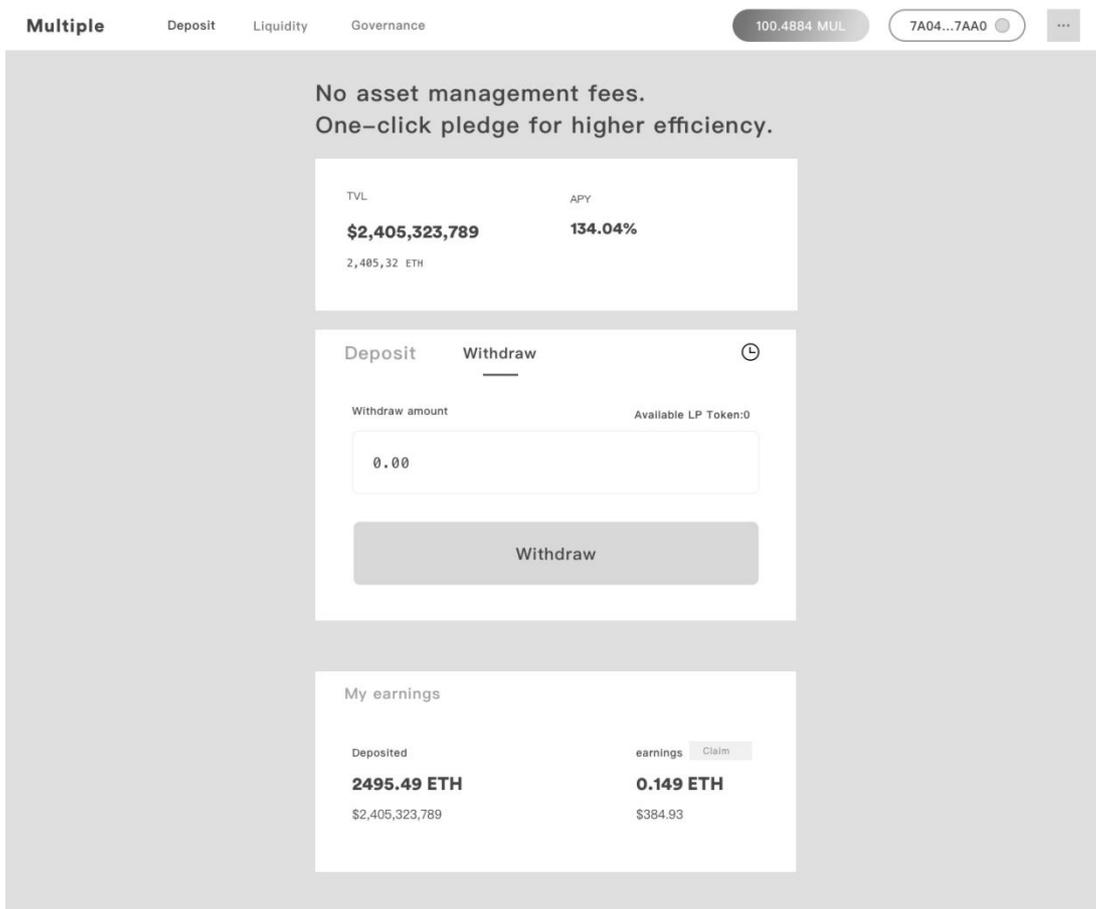
### 4.1.1 Deposit - Make a deposit



### 4.1.2 Deposit - Make a withdrawal



#### 4.1.3 Deposit - Check yield status



#### 4.1.4 Deposit - Check deposit history

The screenshot shows a web interface with a dark theme. At the top, there are navigation tabs: "Multiple", "Deposit", "Liquidity", and "Governance". On the right, there are two circular buttons: "100.4884 MUL" and "7A04...7AA0". Below the navigation, there is a main heading: "No asset management fees. One-click pledge for higher efficiency." In the center, a white modal window titled "历史记录" (History Record) is open. It contains a table with three rows of transaction data:

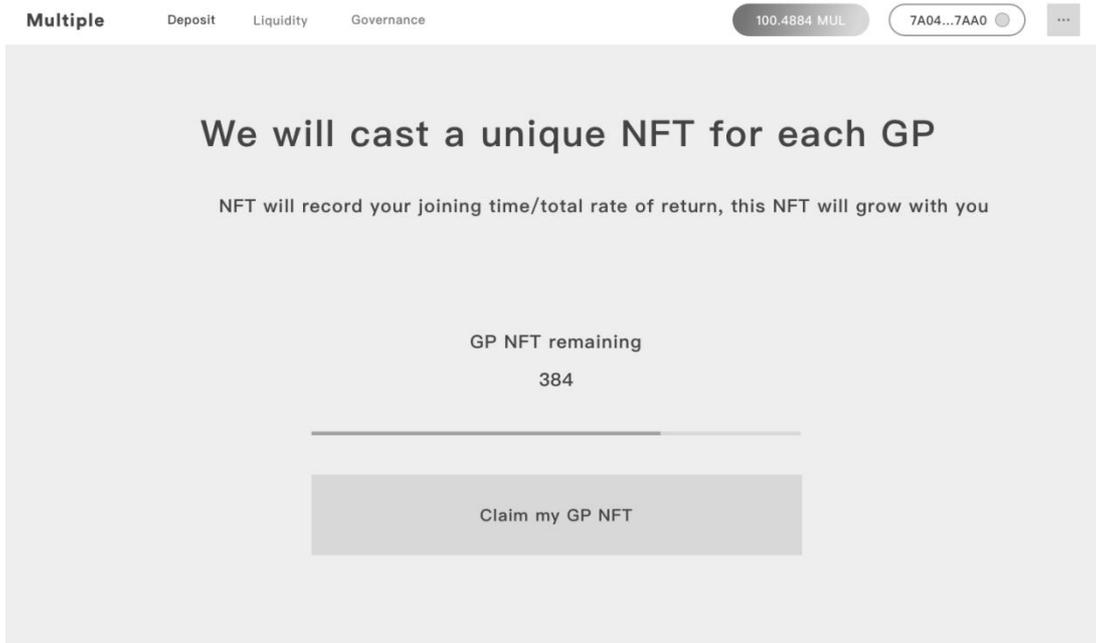
Transaction Type	Status	Time
Deposit ETH	Completed	2021-2-22 19:40:59
Withdraw ETH	processing	2021-2-22 19:40:59
claim earning	processing	2021-2-22 19:40:59

Below the table, there are two columns: "Amount" and "100 ETH". A "Withdraw" button is visible at the bottom of the modal.

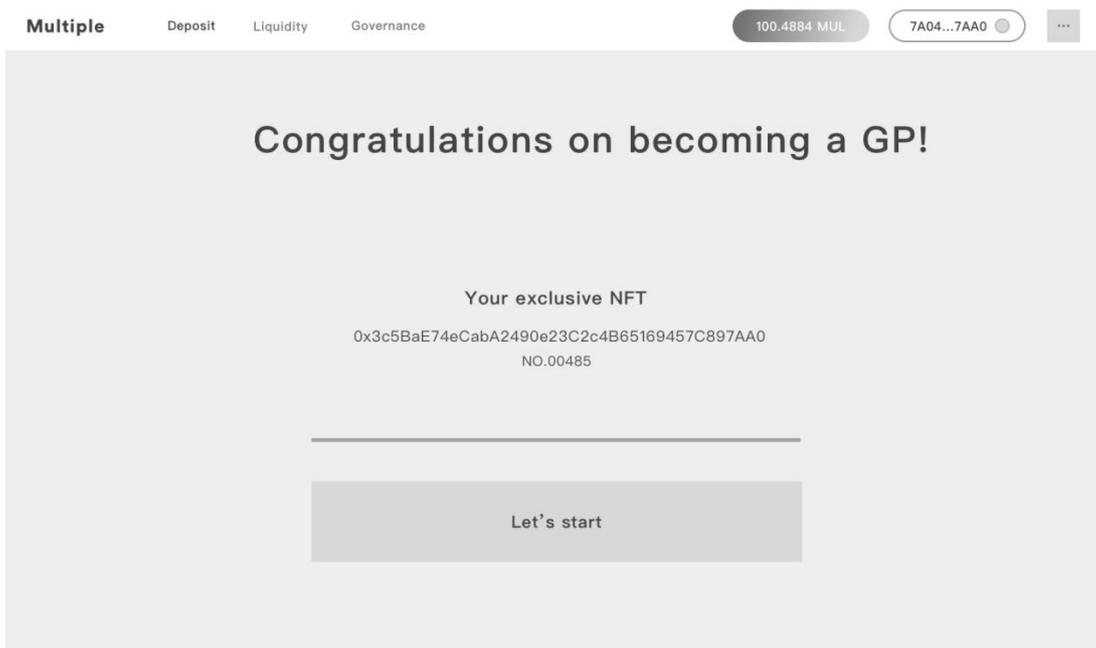
#### 4.2.1 Liquidity - Become a GP

The screenshot shows a web interface with a dark theme. At the top, there are navigation tabs: "Multiple", "Deposit", "Liquidity", and "Governance". On the right, there are two circular buttons: "100.4884 MUL" and "7A04...7AA0". Below the navigation, there is a main heading: "Become a GP, provide liquidity strategies and earn commissions". Below the heading, there are three bullet points: "No cost", "Convenient operation", and "High growth". At the bottom, there is a large "Next" button.

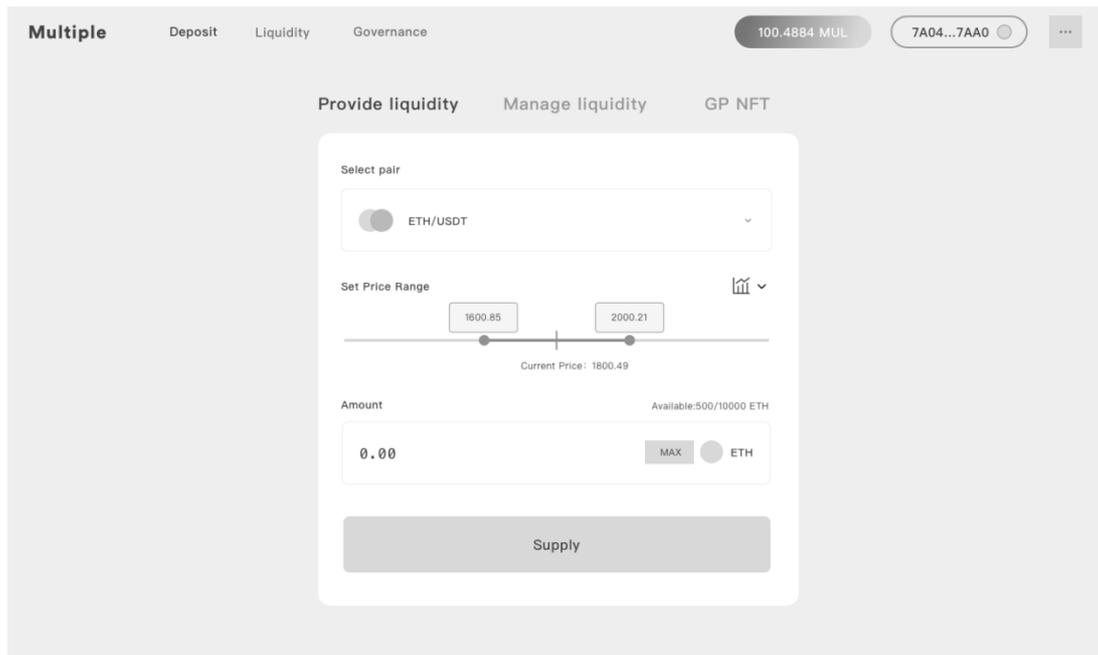
#### 4.2.2 Claim your NFT



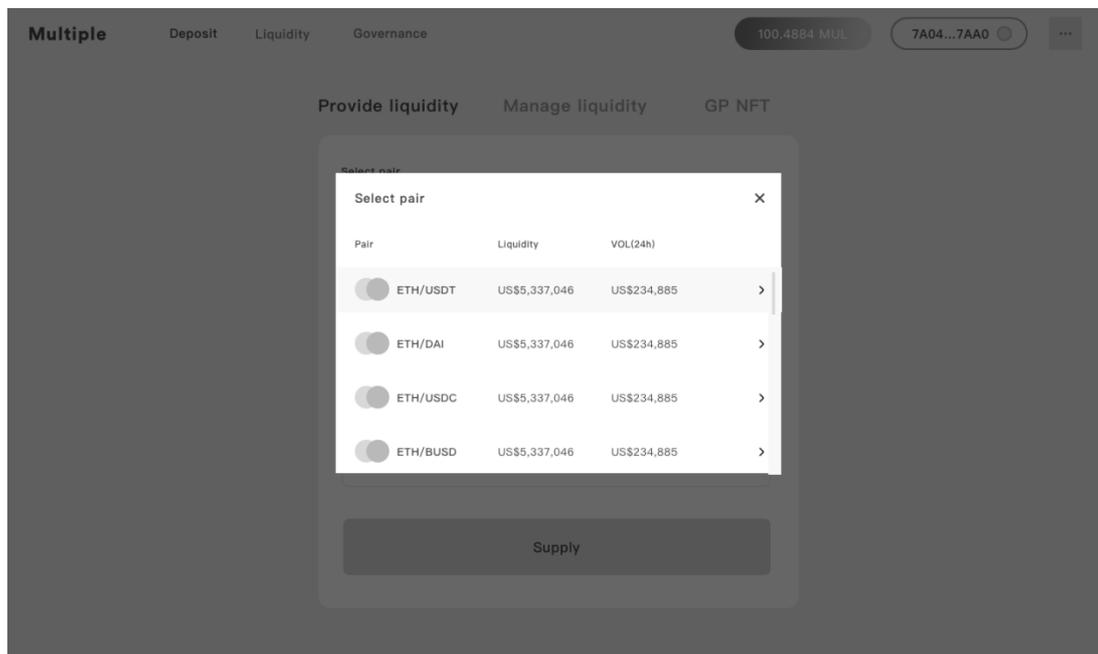
#### 4.2.3 Successfully become a GP



#### 4.3.1 Liquidity - Provide Liquidity



#### 4.3.2 Liquidity - Choose a liquidity pool



#### 4.3.3 Liquidity - Check liquidity breakdown

Multiple    Deposit    Liquidity    Governance    100.4884 MUL    7A04...7AA0    ...

Provide liquidity    Manage liquidity    GP NFT

Select pair

ETH/USDT

Set Price Range

0    2982.34    4121.00    3182.92    Infinity

1600    2000

Current Price: 1800.49

Amount    Available: 500/10000 ETH

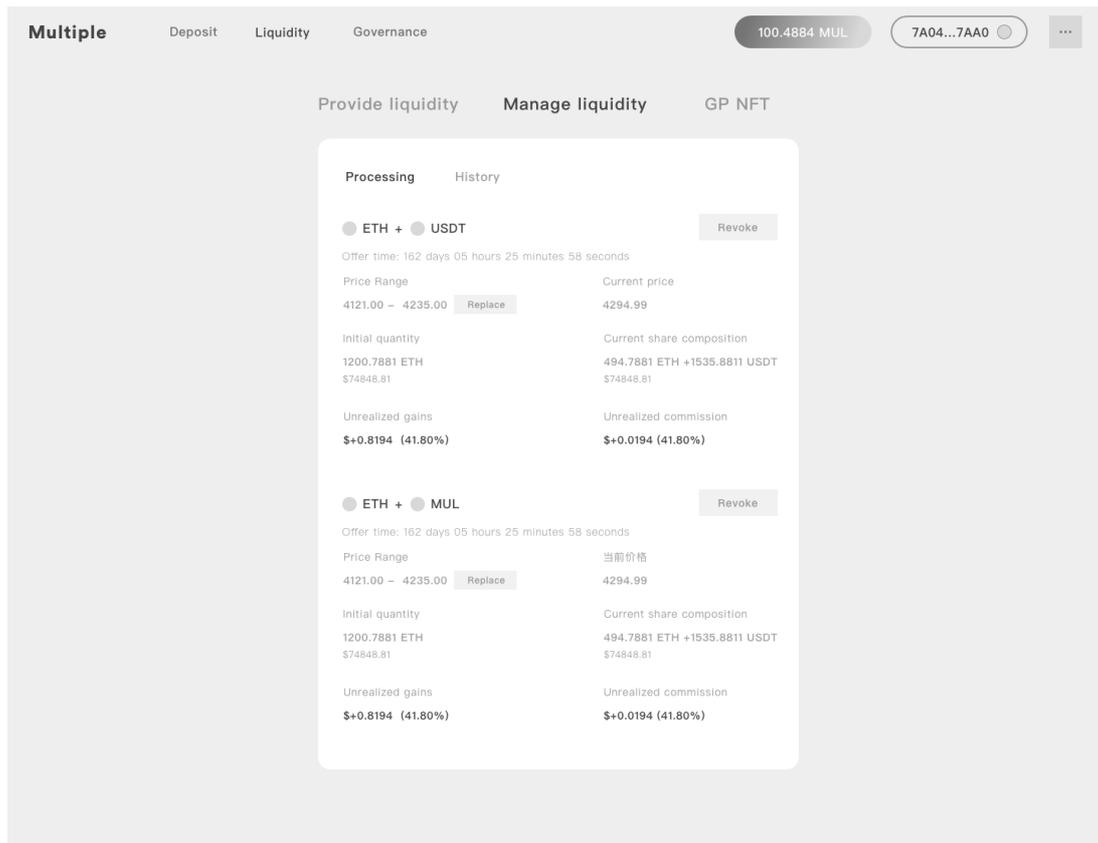
499.9999    MAX    ETH

Liquidity composition

235.5959 ETH + 388444.488 USDT

Supply

4.3.1 Liquidity - Manage liquidity



## 5.Token Economics

### 5.1 MUL Token Basics

Multiple Protocol Token (MUL) is the native governance token of the Multiple

Protocol. MUL is an ERC20 Token with supply capped at 100 million and is used for both protocol governance and as an incentive. When using the Protocol, MUL functions as a guarantee of on-chain governance and activated incentive mechanisms designed to safeguard DeFi assets and yield rewards for community participants. For example, MUL holders enjoy the right to propose and vote on protocol changes, as well as enjoy other rights on the platform.

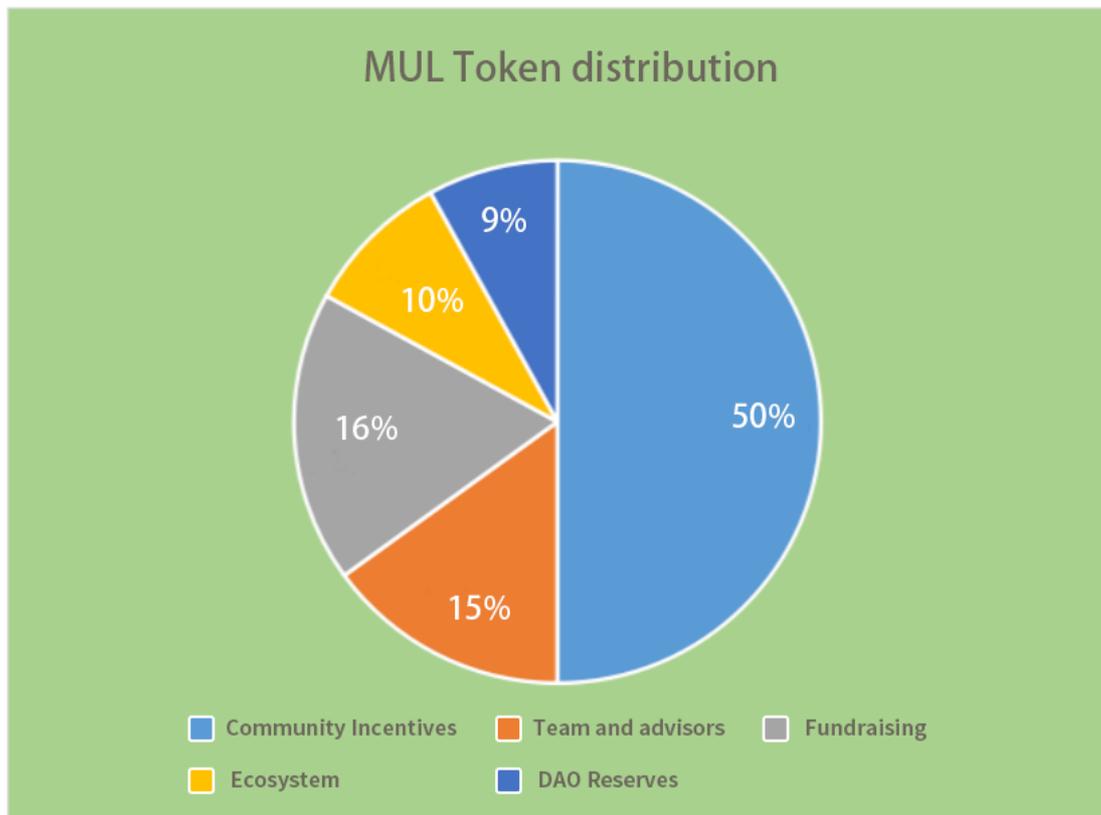
## 5.2 MUL Token Allocation

- Community incentives: 50%  
Including but not limited to the following uses:
  - Incentivize GPs and LPs;
  - Facilitate liquidity farming, trade mining, and new strategy launches;
  - Participate in community governance.
  
- Team and advisors: 15%
  - Used for the team of developers and advisors to vote, ensuring that the voice of the core team is strong enough in the early stage of protocol development.
  
- Fundraising: 16%
  - Seed: 5%
  - Private sale: 10%
  - Public sale: 1%
  
- Ecosystem development fund: 10%  
Including but not limited to the following uses:
  - Introduce new strategic partners, support applications within the MUL Protocol ecosystem, and leverage the community and resources in the future;
  - Reward community volunteers. Once the Protocol goes live, tokens will be given out in batches to outstanding community volunteers through proposals and voting.

- DAO Reserves: 9%

Including but not limited to the following uses:

- Make provisions of liquidity funds for the long-term development of the platform;
- Facilitate future development and on-chain governance of MUL.



### 5.3 MUL Community Incentives

MUL community incentives represent 50% of the total amount of tokens and are to be used to incentivize GPs and LPs, as well as other participants in the MUL eco-system. 30% of this 50% will be used for rewarding LPs; 11% for GPs; 5% for MUL liquidity farming; 2% for DAO governance; and 2% for supervisors.

#### 5.3.1 LP incentives: 30%

In the early stages of expansion, 30% of the MUL tokens will be dedicated to incentivizing LPs. This percentage may be adjusted later through a MUL Improvement Proposal (MIP). 20% of these incentives will be released steadily over the first 12 months with the remaining 80% to be released at a decreased rate of 20% per year. The decay mechanism and parameters, however, can be discussed and voted upon by the community through a governance proposal.

#### 5.3.2 GP incentives: 11%

GP incentives are allocated based on the total value locked in each pool. MUL is staked in order to unlock new strategy pools, and every active pool will receive MUL tokens as incentives. 20% of these incentives will be released initially and the rest will be released later at a deflationary rate of 20% per year. Again, this deflationary mechanism and parameters can be discussed and voted upon by the community through a governance proposal.

#### 5.3.3 Liquidity incentives: 5%

Liquidity incentives are based on the trading pair of MUL/ETH on Uniswap v3. They can be adjusted later through a MIP (MUL Improvement Proposal). 20% of the incentives for this part will be released steadily over the first 12 months with the remaining 80% to be released at a decreased rate of 20% per year. The decay mechanism and parameters, however, can be discussed and voted upon by the community through a governance proposal.

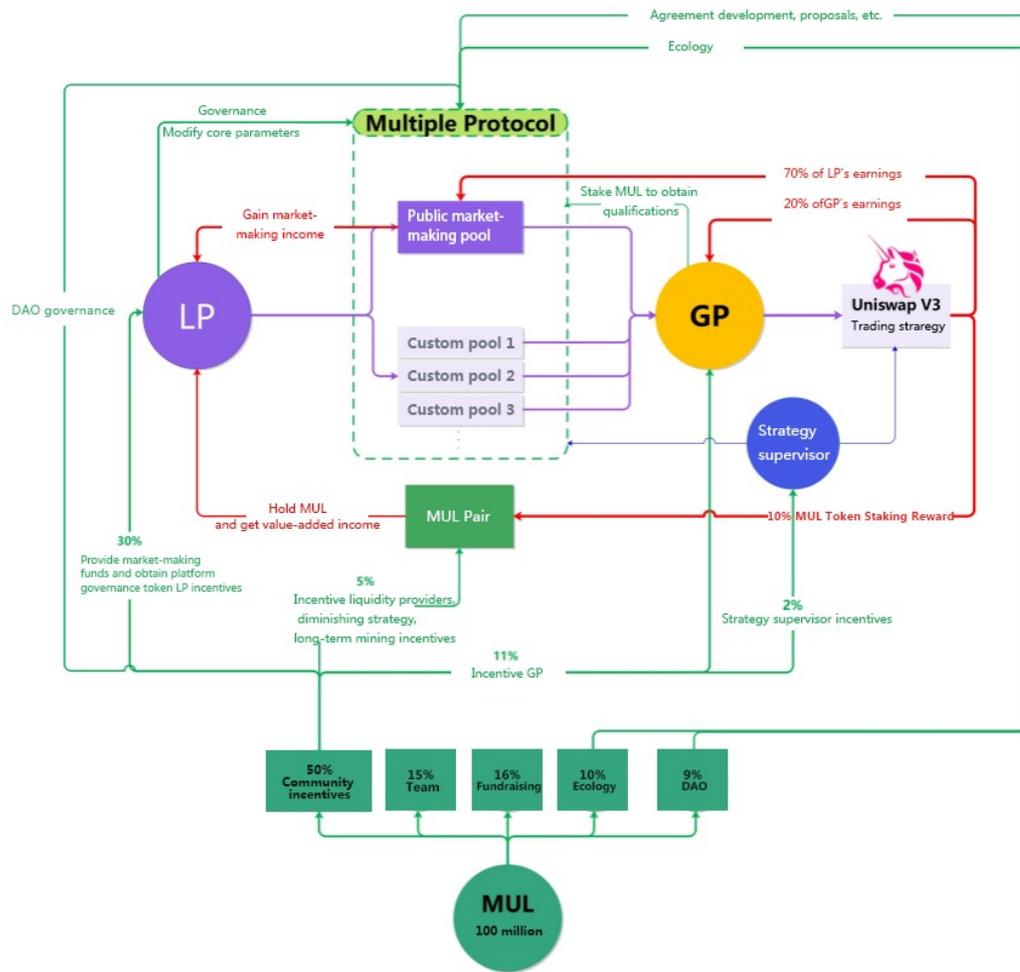
#### 5.3.4 DAO governance incentives: 2%

DAO governance incentives are the core module of MUL governance incentives. Participants in the ecosystem can stake MUL tokens for mTokens, which can then be staked for on-chain governance votes and used to take part in the long-term development of the MUL Protocol. Users staking MUL tokens also receive returns in MUL in two parts: a percentage of overall platform yields and 5% of DAO incentives. The specific distribution mechanism is to be determined by the community through on-chain governance.

#### 5.3.5 Strategy Supervisor Incentives:: 2%

Strategy supervisor is an important new role developed by MUL Protocol and designed to play a crucial role in risk management, price feed, and on-chain governance. Strategy supervisors must stake MUL tokens and only those who take an active part in the development of the system will be rewarded. If the yield of a certain strategy is negative, punishments shall apply, and the Protocol will automatically deduct 20% of MUL tokens staked.

## 5.4 Liquidity and Appreciation Flowchart



## 6. Governance Model

### 6.1 Governance Process

In the initial stages, an unimposing governance structure based primarily on Compound will be adopted for MUL in order to engage more MUL holders in the governance system; this method will emphasize usability and universality.

### 6.2 Governance Incentives

MUL incentives also define the rules of MUL token generation. The main purpose of incentives is to ensure the security and persistency of the MUL Protocol and to achieve the common goal of ecosystem development. Giving appropriate incentives to

participants also helps enhance the system, boost creativity, and facilitate long-term growth.

Users can enjoy multiple ways to obtain MUL: either by participating in strategies, taking part in governance, or providing liquidity after obtaining MUL tokens. Tokens used for governance lose their liquidity and are therefore exchanged for governance rights with the source and amount of governance incentives to be determined by MIP governance voting.

#### References:

Uniswap whitepaper-v3