



# VirtuSwap

The **Most Efficient** DEX.  
Governed by **AI**

Litepaper

Version 1.0 | May 2023

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# What is VirtuSwap

VirtuSwap is on a mission to make Decentralized Exchanges dominate the crypto trading landscape, by enabling efficient, cheap trades; while multiplying yields to liquidity providers. This is achieved by a combination of revolutionary financial engineering, state-of-the-art research, and AI-based governance of the protocol.

VirtuSwap's core target market is trades involving "99% of assets" (i.e. all assets outside top 5 on a given chain), which suffer from insufficient liquidity, leading to excessive trading costs.

- Our "*Reserve Powered Pools*", a **new pool architecture** that eliminates inefficiencies and costs associated with indirect trades that affect 99% of crypto assets; while lowering typical pool imbalances, which means lower gains to arbitrageurs and MEV bots. This results in higher net expected returns for LPs and larger equilibrium pool sizes, lowering trading costs further.
- Our **proprietary AI Governance system**, which constantly analyzes trading activity to suggest the best incentive structure for liquidity pools to maximize an objective function, such as trading volume, pool fees or any linear combination therein.

Based on extensive simulations using real world data, implementation of the combination of revolutionary financial engineering and AI-based liquidity allocation optimization can result in an **up to 5X increase in yields of liquidity providers.**

# DEX industry at a glance

Decentralized Exchanges (DEXes) are an amazing piece of technology. Essentially, DEXes, along with lending protocols and on-chain stablecoins are one of the very few real applications of the smart contract technology.

Year 2022 has shown the community, in the hard way, that centralized exchanges can be very problematic.

The whole idea of blockchain is to remove the need for trusted third parties, and DEXes do exactly that for the asset exchange industry.

Over **\$3 Trillion**

Total trading volume  
since inception

Only **10%**

of total Crypto trading

Since creation of DEXes, **over \$3 Trillion of value** has been exchanged. However, **DEXes still account for only 10% of the total crypto trading.**

We are strong believers in the DEX technology, and we want to see the future where DEXes control over 50% of the total crypto trading volume.

Moreover, we believe that in the future the DEX technology will become a significant part of non-crypto asset trading as well.

VirtuSwap contributes to the overall DEX movement by solving important and painful problems in DEX efficiency.

# A Huge Niche - the 99 Percent

Let's look at the DEX trading market today. We can divide all trades into three categories:

- Trading among major assets (WETH and WBTC in the case of Ethereum ) and between major assets and stablecoins ( USDC, USDT, DAI )
- Trading among stablecoins (USDC, USDT, DAI, BUSD, FRAX, etc.).
- Trading involving the remaining 99 percent of assets (LINK, MATIC, QUICK, APE, and hundreds more) as at least one of the sides of a trade (e.g., LINK-MATIC but also LINK-USDC).

In most cases, trades involving the 99 percent assets are indirect, because there are no direct pools to connect these assets, or such pools are too small to allow efficient trading.

For example, try to find a LINK-APE pool. It just doesn't exist, so if a trader wants to swap LINK for APE, they effectively perform an indirect trade, swapping LINK->WETH first and then WETH->APE.

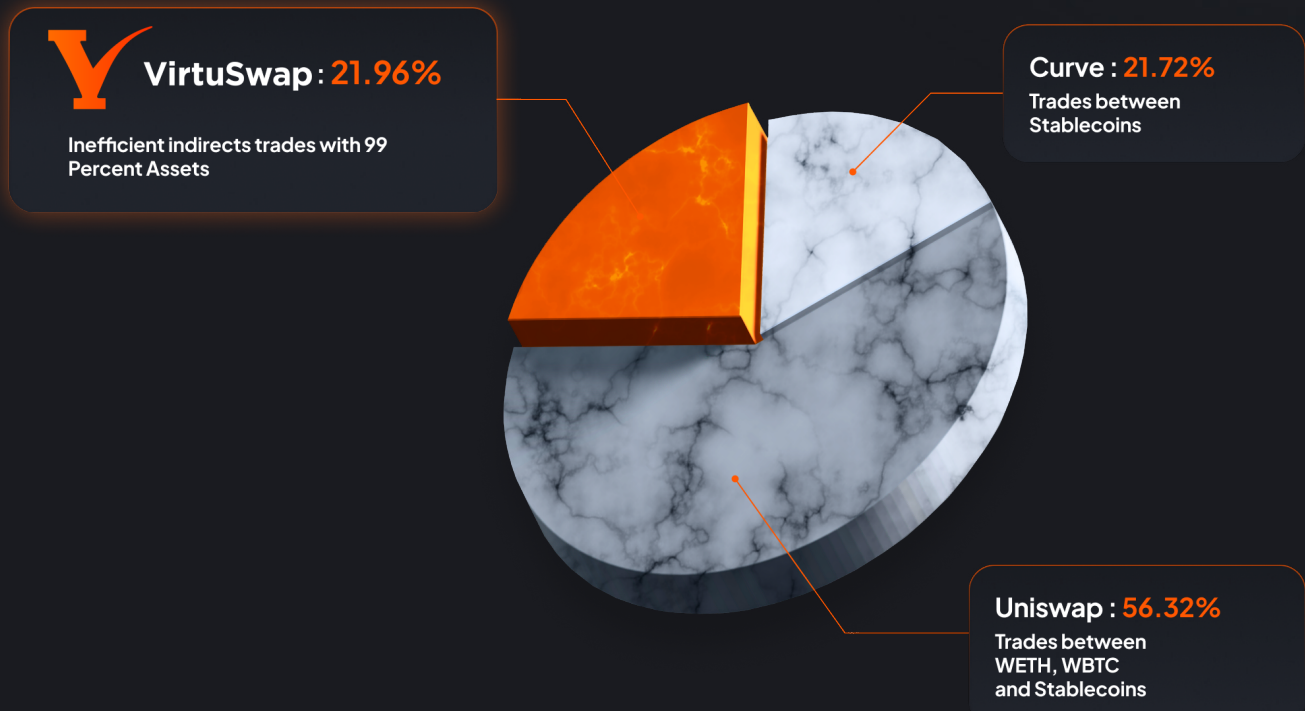
That means that the trader pays **two fees**, suffers **two price impacts**, and also pays gas fee for **two swaps**. Amazingly, around 20% of all the DEX trading volume is like this - indirect trades involving smaller coins.

**This volume is roughly equivalent to all the stablecoin trades.**

Curve (one of our favorite DEX projects), revolutionized Stablecoin trading by making it more efficient than the original Uniswap technology.

*VirtuSwap is doing the same for the 99 Percent Assets, providing low trading costs and low price impact to traders, and high capital efficiency to LPs*

## A Huge Niche - the 99 Percent Assets



**VirtuSwap is for 99 Percent assets  
what Curve is for Stablecoins**

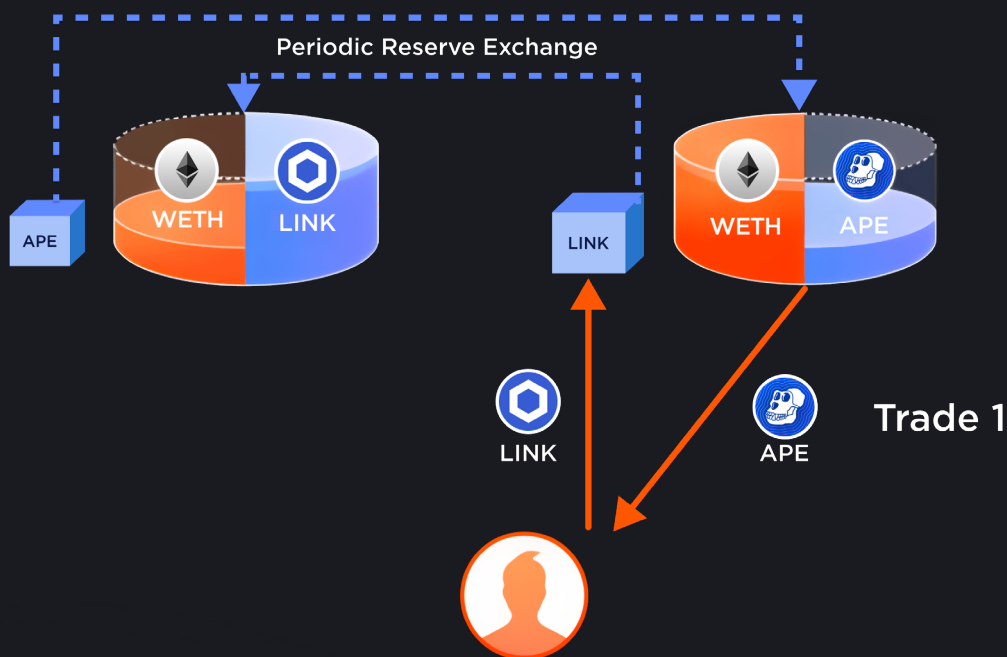
# Reserve-based Virtual Pools

Reserve-Powered Pools are the key financial innovation of VirtuSwap, eliminating inefficiencies currently present in all DEX trades in which a direct pair between two tokens does not exist or is not deep enough.

A pool on VirtuSwap pool allows trading between two main assets, similar to Uniswap. However, VirtuSwap pools can also accept additional (reserve) assets as payment for one of

the main assets, where the pricing is computed via pool-triangulation-based “virtual trading curves”.

The pools temporarily hold the reserves and later on exchange them back to the native assets with other VirtuSwap pools. This way, if the user wants to swap LINK to APE, they can sell Link to APE-WETH pool, and the APE-WETH pool will later exchange LINK for APE with the LINK-WETH pool.



The result is that on VirtuSwap any trade is direct, and the trader always pays only one pool fee, one gas fee and one price impact.

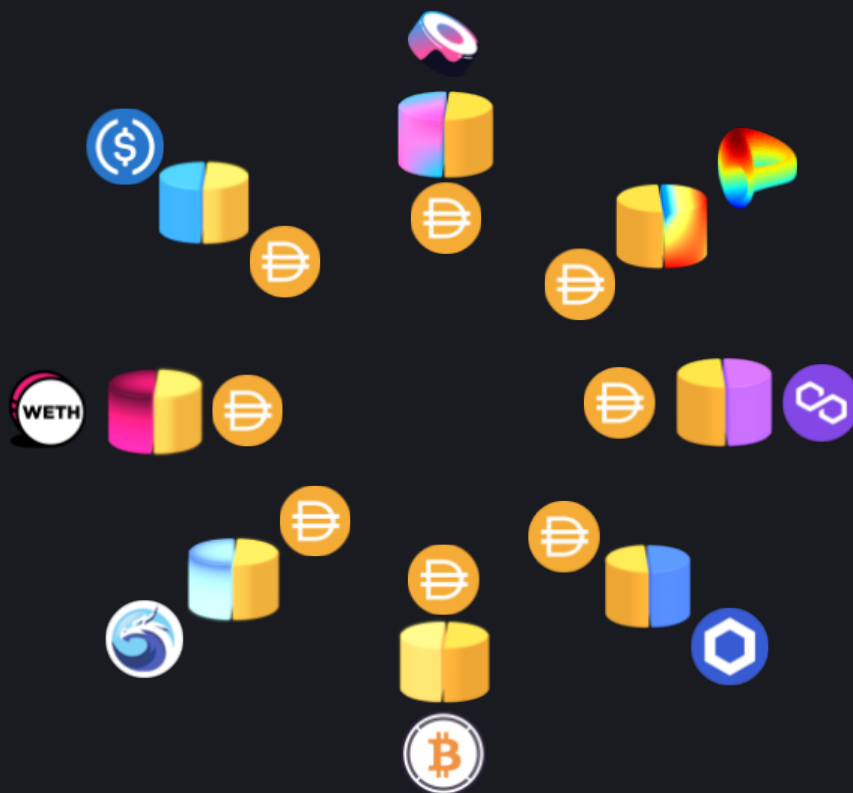
**One trade. One Fee. One Price Impact.**

## Reserve-based Virtual Pools

Unlike any other DEX, where pools are essentially independent, VirtuSwap pools work together to achieve a common goal.

VirtuSwap can use hub-and-spoke or multiple hub-and-spoke pool architecture, meaning that all assets are interconnected through one or more “central” assets. In this architecture, every asset can be directly traded for any other asset, and the liquidity is multiplied.

For example, **10 pools allow direct trading in 45 pairs.**



Importantly, interconnectedness of pools **does not imply interconnectedness of risks** – and in this way this architecture is *vastly* superior to the omnipool architecture that has been proposed as a solution to the problem of triangular trades.

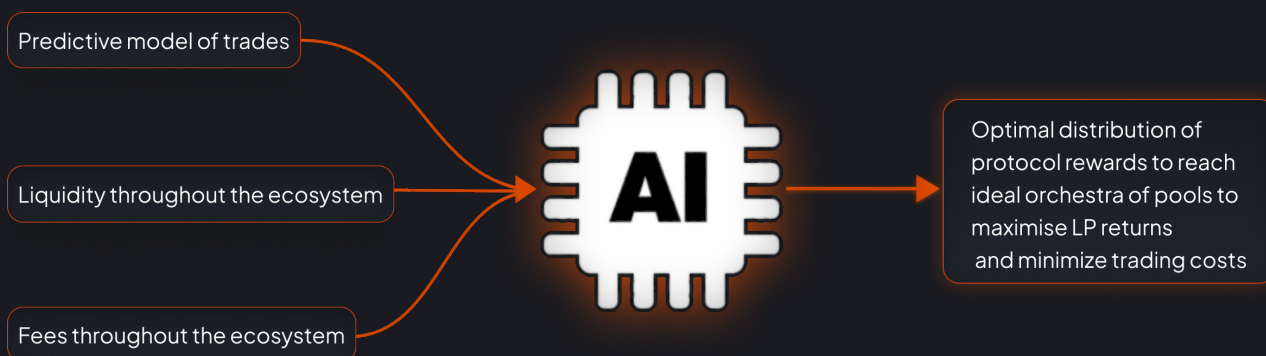


# AI Governance

DeFi protocols reward their users for actions that are useful for the protocol. Bitcoin rewards miners, Ethereum rewards validators, and DEXes reward Liquidity Providers who are essential for the performance of the protocol.

VirtuSwap introduces **Minerva**, an AI-powered liquidity optimizer that is used for optimal distribution of protocol rewards between different pools.

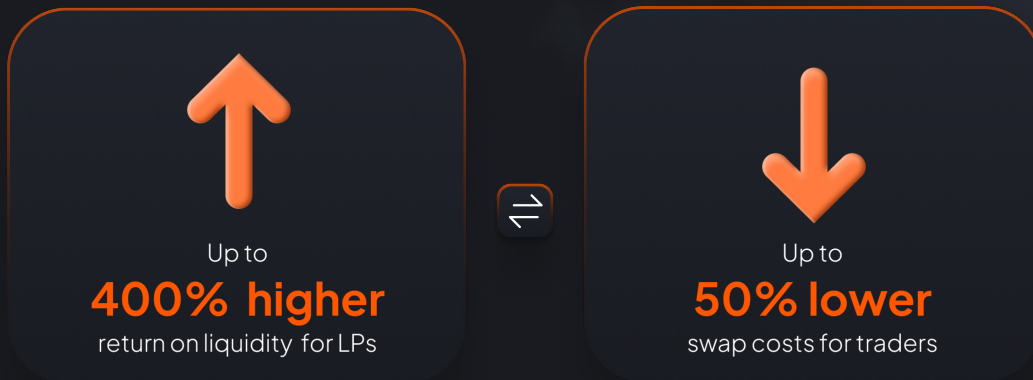
Minerva uses sophisticated algorithms to analyze market conditions, predict future trades, relations between rewards and liquidity, with the goal of optimizing liquidity for best results for LPs and/or traders.



AI-based optimization achieves better prices, lower price impact, and overall more efficient trading for VirtuSwap traders, and higher returns for LPs.

**With Minerva, VirtuSwap is solving one of the biggest challenges in DeFi: efficient allocation of liquidity.**

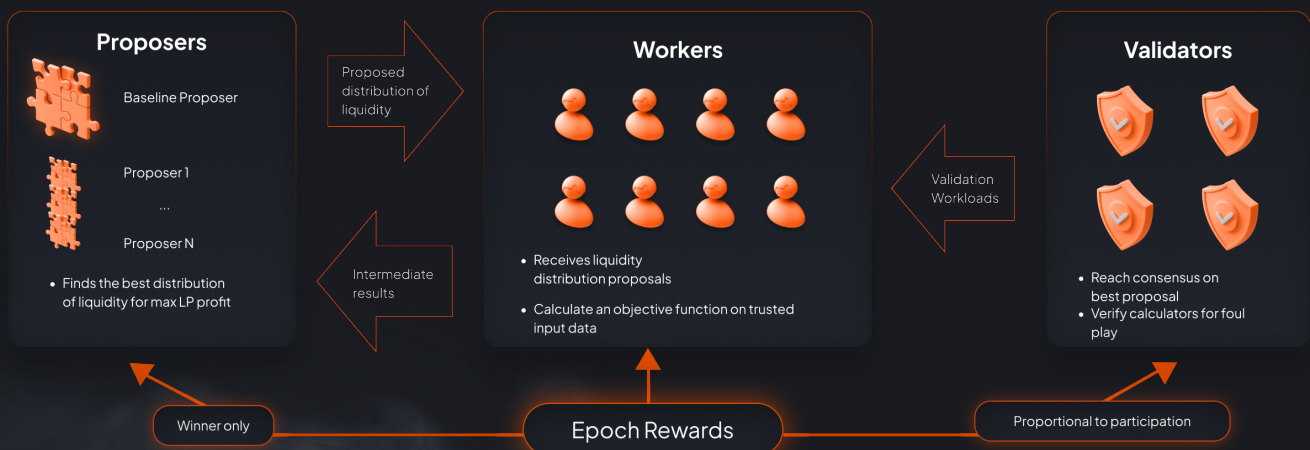
## AI Governance



Minerva accomplishes amazing capital efficiency unattainable before, especially for assets outside the top 5.

Optimal distribution of liquidity with Minerva, coupled with revolutionary financial engineering results in **up to x5 higher returns on funds for LPs**, as well as **up to 50% decrease of trading costs** for

At a later stage, Minerva will open up for other protocols, letting them optimize their own liquidity in a fully decentralized and trustless fashion, performing heavy calculations efficiently and cheaply.



Minerva is a game-changer for the DeFi space. It's the first AI-powered liquidity optimizer of its kind, and it's set to transform the way we trade on decentralized exchanges.

# Tokenomics

VRSW is the governance token of VirtuSwap protocol.

The token is used to coordinate decentralized activities and align interest of various stakeholders who interact with the protocol; to increase protocol decentralization; and to incentivize value creation on the protocol (e.g liquidity provision, growth).

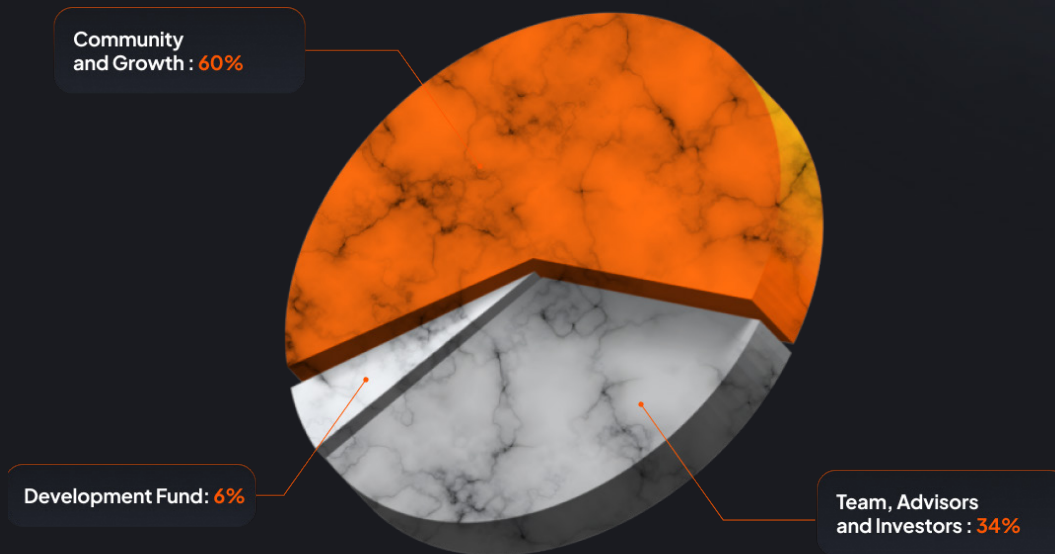


VRSW utility includes the following:

- Staking VRSW to gain additional rewards for liquidity providers. Staking VRSW tokens provides an added boost to LPs, in the form of newly minted VRSW tokens. An innovative feature of VRSW rewards is that they increase in the duration of staking. VirtuSwap is the only protocol to the best of our knowledge that rewards prolonged staking of tokens without requirement for locking them (although locking increases the rewards further).
- Yield farming unrelated to liquidity provision.
- Staking VRSW to redeem voting rights (in the form of veVRSW) and participate in decision making of the protocol. A new veVRSW is minted every time a VRSW token is staked, and the DAO voting power is derived from relative veVRSW holdings.

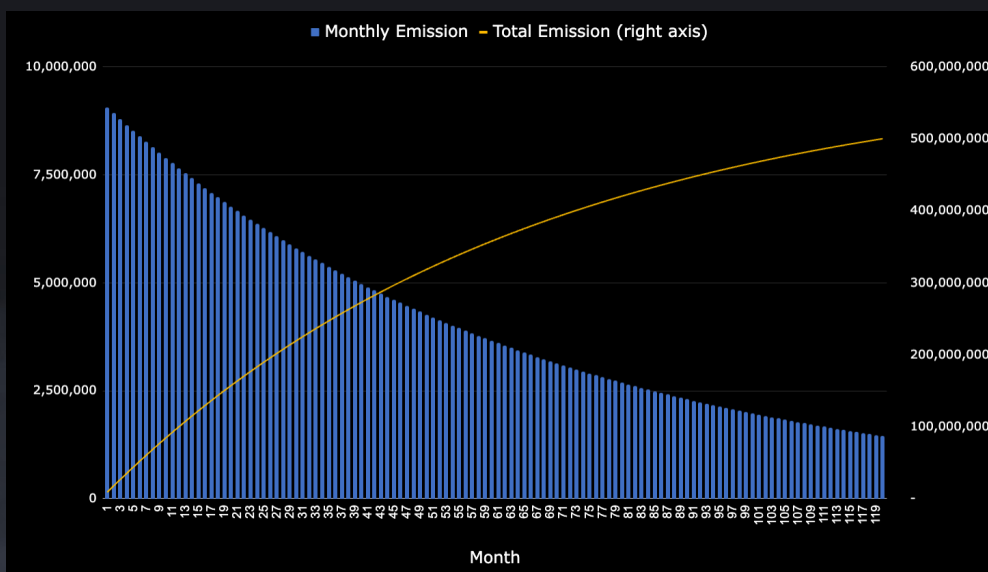
## Tokenomics

Total supply of VRSW is capped to **1,000,000,000 tokens**, which are allocated as follows:



Initially, 50% of the total VRSW supply will be minted. Most of that (34% of total) is allocated to Investors (with 1 year vesting) and core team (3 year vesting). Another 6% are allocated to development fund, and 10% are allocated to VirtuSwap DAO treasury to sponsor various growth activities including ad-hoc rewards to liquidity providers.

The remaining 50% will be algorithmically minted over 10 years on a deflationary schedule:



# DAO Governance

VirtuSwap protocol will be governed by VirtuSwap DAO using a token based voting process. Thus, stakers of VRSW token will receive it's vote-escrowed version - veVRSW.

As decentralized governance is still in its infancy, we looked at best practices in the market as a benchmark with a goal to have a modest yet fully functional design for decentralized decision making.