# Fountain Protocol

Supply, borrow, and earn. More than a DeFi lending protocol.
Powered by Oasis

Abstract:  Fountain Protocol ("Fountain") is an algorithmic-based money market system designed to bring a complete decentralized finance-based lending and credit system onto Oasis Network. Fountain enables users to by utilize their cryptocurrencies by supplying collateral to the network that may be borrowed by pledging over-collateralized cryptocurrencies. This creates a secure lending environment where the lender receives a compounded interest rate annually (APY) paid per block, while the borrower pays interest on the cryptocurrency borrowed. These interest rates are set by the protocol in a curve yield, where the rates are automated based on the demand of the specific market, such as Bitcoin. The difference of Fountain from other money market protocols is the ability to use the collateral supplied to the market not only to borrow other assets but also to mint synthetic stablecoins with over-collateralized positions that protect the protocol. These synthetic stablecoins are not backed by a basket of fiat currencies but by a basket of cryptocurrencies. Fountain utilizes the Oasis Network for fast, low-cost transactions while accessing a deep network of wrapped tokens and liquidity.

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# Introduction

The Fountain Protocol is designed to enable a complete algorithmic money market protocol on Oasis Network. The protocol designs are architected and forked based on Compound[1] and Curve[2] and synced into the Fountain platform giving the benefits of both systems into one.

Taking advantage of the extremely efficient and low-cost Oasis Network, Fountain Protocol establishes a multi-revenue protocol with a fund pool as the core and multiple application scenarios.

With the help of Oasis Network privacy features, users can experience one-stop management of DeFi assets, and services such as lending, trading at the best rate, leverage, and liquidity mining. Its built-in cross-chain function would once again improve the efficiency of user funds.

## Problems

The market for cryptocurrencies and digital blockchain assets has developed into a vibrant ecosystem of investors, speculators, and traders, exchanging thousands of blockchain assets.

Unfortunately, the sophistication of financial markets hasn't followed: participants have little capability of trading the time value of assets.

Interest rates fill the gap between people with surplus assets they can't use, and people without assets (that have a productive or investment use); trading the time value of assets benefits both

parties, and creates non-zero-sum wealth. For blockchain assets, two major flaws exist today:

- Borrowing mechanisms are extremely limited, which contributes to mispriced assets (e.g."scamcoins" with unfathomable valuations, because there's no way to short them).

- Blockchain assets have negative yield, resulting from significant storage costs and risks (both on-exchange and off-exchange), without natural interest rates to offset those costs. This contributes to volatility, as holding is disincentivized.

Centralized exchanges (including Bitfinex, Poloniex...) allow customers to trade blockchain assets on margin, with "borrowing markets" built into the exchange. These are trust-based systems (you have to trust that the exchange won't get hacked, abscond with your assets, or incorrectly close out your position), are limited to certain customer groups, and limited to a small number of (the most mainstream) assets. Finally, balances and positions are virtual; you can't move a position on-chain,for example to use borrowed Ether or tokens in a smart contract or ICO, making these facilities inaccessible to dApps.

Peer to peer protocols facilitate collateralized and uncollateralized loans between market participants directly. Unfortunately, decentralization forces significant costs and frictions onto users; in every protocol reviewed, lenders are required to post, manage, and (in the event of collateralized loans) supervise loan offers and active loans, and loan fulfillment is often slow & asynchronous (loans have to be funded, which takes time) .

## Solution

Creating a protocol that enables a traditional money market tied into synthetic stablecoin generation will lead to accessibility and benefit of locked collateral. Fountain will enable anyone to utilize a high-speed and low transaction cost blockchain by leveraging Oasis Network to supply collateral, earn interest on that collateral, borrow against that collateral, and mint stablecoins on-demand within seconds.

This protocol unlocks billions of dollars in value that are currently on-chains, enabling the participant to access liquidity in real-time.

# Fountain Protocol

Fountain is a protocol on the Oasis Network that establishes money markets, which are pools of assets with algorithmically derived interest rates, based on the supply and demand for the asset. Suppliers (and borrowers) of an asset interact directly with the protocol, earning (and paying) a floating interest rate, without having to negotiate terms such as maturity, interest rate, or collateral with a peer or counterparty.

With the help of Oasis Network privacy features, users can experience one-stop management of DeFi assets, and services such as lending, trading at the best rate, leverage, and liquidity mining. Its built-in cross-chain function would once again improve the efficiency of user funds.

## Supplying Assets

Unlike an exchange or peer-to-peer platform, where a user's assets are matched and lent to another user, the Fountain protocol aggregates the supply of each user; when a user supplies an asset, it becomes a fungible resource. This approach offers significantly more

liquidity than direct lending; unless every asset in a market is borrowed (see below: the protocol incentivizes liquidity), users can withdraw their assets at any time, without waiting for a specific loan to mature.As the money market accrues interest,which is a function of borrowing demand, cTokens become convertible into an increasing amount of the underlying asset.

## Borrowing Assets

Fountain allows users to frictionlessly borrow from the protocol, using fTokens as collateral, for use anywhere in the ecosystem. Unlike peer-to-peer protocols, borrowing from Fountain simply requires a user to specify a desired asset; there are no terms to negotiate, maturity dates, or funding periods; borrowing is instant and predictable. Similar to supplying an asset, each money market has a floating interest rate, set by market forces, which determines the borrowing cost for each asset.

## Synthetic Stablecoins

The Fountain Protocol, to start, will enable users to mint FAI (FAI), a synthetic stablecoin based on the price of $1 USD, by using the fTokens from the underlying collateral that they have previously supplied to the protocol. Users can borrow up to 50% of the remaining collateral value they have on the protocol from their fTokens to mint FAI.
Stablecoins on theFountain Protocol can be synthetically designed through Governance and added as a proposal. FAI will be the protocol's default stablecoin that can be minted by collateral already pledged in Fountain.
These stablecoins will not have yielded curves that determine their interest rates, which in other protocols are known as stability fees. Interest rates will be determined by the Governance process within the Fountain Protocol.

### Pricing Mechanisms

Since no underlying fiat reserves are guaranteeing the value of the synthetic stablecoin on the Fountain Protocol, it will rely on market forces, the basket of collateral, and safety mechanisms to maintain its peg to the fiat currency it is designed to synthesize. As an example, FAI will originally maintain a peg of 1:1 per FAI:USD.
The market is encouraged to maintain this peg so that programmatic mechanisms designed to protect the peg will not be initiated by the protocol. If there becomes a point where FAI or another synthetic stablecoin loses its peg value, the protocol can use the Governance process to initiate the Price Adjustment Module. This module will enable the change of parameters within the stablecoin system on Fountain to disattach the peg and create a change in supply and demand to bring the stability back to its original peg.
This system will enable two main points. A benefit to hold/buy a synthetic stablecoin, or mint/borrow a synthetic stablecoin. This is determined whether the price peg has become negative or positive due to external market conditions.

## Stablecoin Parameters

Users who have the protocols native tokens can create proposals to change specific parameters of the synthetic stablecoins on the platform by utilizing the on-chain Governance system. These parameters are set up from a protocol-risk perspective to protect the interest of the users and the platform. The parameters that users can control are the following:

● Max Supply: This determines the maximum number of synthetic stablecoins units can be minted at any given point to determine the synthetic stablecoins maximum supply.

● Interest Rate: The interest rate parameter controls how much in interest fees the user pays for minting these synthetic stablecoins.These interest rates go directly into the Reserve Factor community funds.

● Collateral Ratio: Each synthetic stablecoin will be a liquidation price. These liquidation prices are controlled by the Collateral ratio for each synthetic stablecoin.

● Penalty Ratio: If a liquidation occurs, there will be a penalty percentage you must pay the protocol. This penalty ratio is set by the protocol.

## Stablecoin Redemption

Synthetic stablecoins on the Fountain Protocol are created by supplying and locking a single or basket of cryptocurrencies. fUSD is exchangeable to all supporting assets, including USD, which can be redeemed directly to your bank account for verified users.

## Fountain Token(FTP)

The main purposes of the Fountain Protocol token are to incentivise liquidity providers on the Fountain Protocol platform as well as getting as many users involved as possible in the governance of the protocol.
Currently FTP has three main uses: voting, staking and boosting. Those three things will require you to vote, lock your FTP and acquire vFTP.

## fToken

The protocol-created pegged assets when collateral is supplied are called fTokens. fTokens represent the unit of the collateral supplied and can be used as a redemption tool.
User's balances are represented as fToken balances; users can mint(uint amountUnderlying) fTokens by supplying assets to the market, or redeem(uint amount) fTokens for the underlying asset. The price (exchange rate) between fTokens and the underlying asset increases over time, as interest is accrued by borrowers of the asset.

## Leveraged Trading

Through smart contracts, Fountain protocol enables leveraged trading through pledges, providing a new financial derivative tool for more arbitrage and token allocation for experienced users.

Currently, cryptocurrency exchanges offer leveraged trading through margin or derivative trading, such as Binance and FTX. Current popular DeFi projects like Compound and Aave, since the tokens users borrowed would directly go to their wallet address. That make the leveraged part impossible.Fountain protocol creatively connects the DExes with smart contracts, with the funds locked in smart contracts, users can use the leveraged tools, without the risk of default. Now Fountain protocol supports 5x leverage, it will increase to 100x in the future.

## Cross-Chain Lending

Currently the top lending services on the market are based on EVM. But it is difficult to be compatible for emerging public chain systems. During the explosion of digital currencies, new public chains often outperform the existing ones, with more new features, low transaction fees, and efficient transactions. Therefore, Fountain protocol supports multiple public chains, especiallyOasis, Solana, Algorand, BSC, HECO,Avalanche and other new generations of public chains.

## Fiat/Crypto Exchange

Integrate the exchange service from Wyre / Moonpay / Simplex  etc. to ensure the traditional financial users are able to pay with their bank card to enjoy DeFi yield.

# Implementation & Architecture

At its core, a Compound money market is a ledger that allows Oasis accounts to supply or borrow assets, while computing interest, a function of time. The protocol's smart contracts will be publicly accessible and completely free to use for machines, dApps and humans.

## Controller Contract

The Fountain protocol does not support specific tokens by default; instead, markets must be whitelisted. This is accomplished with an admin function, supportMarket(address market, address interest rate model) that allows users to begin interacting with the asset. In order to borrow an asset, there must be a valid price from the Price Oracle; in order to use an asset as collateral, there must be a valid price and a collateralFactor.

Each function call is validated through a policy layer, referred to as the Comptroller ; this contract validates collateral and liquidity, before allowing a user action to proceed.

## Collateral Value

Assets held by the protocol (represented by ownership of a fToken) are used as collateral to borrow from the protocol. Each market has a collateral factor, ranging from 0 to 1, that represents the portion of the underlying asset value that can be borrowed. Illiquid, small-cap assets have low collateral factors; they do not make good collateral, while liquid, high-cap assets have high collateral factors. The sum of the value of an accounts underlying token balances, multiplied by the collateral factors, equals a user's borrowing capacity .

Users are able to borrow up to, but not exceeding, their borrowing capacity, and an account can take no action (e.g. borrow, transfer fToken collateral, or redeem fToken collateral) that would raise the total value of borrowed assets above their borrowing capacity; this protects the protocol from default risk.

### Value Oracles

Collateral Values are propagated from price feed Oracles, such as Chainlink, which pull market price data and send these values on-chain, so they are transparent and verifiable. Due to the fast speed and architecture of the Oasis Network, these price feeds are easily ascertainable with low cost and high efficiency directly on-chain. Currently, there is a hurdle of bottleneck issues from oracles, such as Chainlink, which are provided on Ethereum. With rising gas costs and congestion, these pricing oracles are not updating prices as efficiently or economically.

## Governance

Fountain will begin with centralized control of the protocol (such as choosing the interest rate model per asset), and over time, will transition to complete community and stakeholder control.

The following rights in the protocol are controlled by the admin:
● The ability to list a new fToken market
● The ability to update the interest rate model per market
● The ability to update the oracle address
● The ability to withdraw the reserve of a fToken
● The ability to choose a new admin, such as a DAO controlled by the community; because this DAO can itself choose a new admin, the administration has the ability to evolve over time, based on the decisions of the stakeholders

## Liquidation

If a user's borrowing balance exceeds their total collateral value (borrowing capacity) due to the value of collateral falling, or borrowed assets increasing in value, the public function liquidate(address target, address collateralAsset, address borrowAsset, uint closeAmount) can be called, which exchanges the invoking user's asset for the borrower's collateral, at a slightly better than market price.

## Interest Rates

Rather than individual suppliers or borrowers having to negotiate over terms and rates, the Fountain protocol utilizes an interest rate model that achieves an interest rate equilibrium, in each money market, based on supply and demand. Following economic theory, interest rates (the "price" of money) should increase as a function of demand; when demand is low, interest rates should be low, and vise versa when demand is high. The utilization ratio U for each market a unifies supply and demand into a single variable:

The demand curve is codified through governance and is expressed as a function of utilization. As an example, borrowing interest rates may resemble the following:

The interest rate earned by suppliers is implicit , and is equal to the borrowing interest rate,multiplied by the utilization rate.

## Reserve Factors

Each fToken contract and underlying collateral will have a reserve factor from a basis of 0-90%. This means there will be reserves that the protocol captures between the spreads of borrowing and supplying. These reserve factors are added to the protocol and can be used for community development, improvements, protections, and more. These Reserve Factor funds are controlled by the Governance process and can be used in a variety of protocol security distributions or rewards mechanisms.

# Summary

● Fountain creates properly functioning money markets for Oasis assets
● Each money market has interest rates that are determined by the supply and demand of the underlying asset; when demand to borrow an asset grows, or when supply is removed, interest rates increase, incentivizing additional liquidity
● Users can supply tokens to a money market to earn interest, without trusting a central party
● Users can borrow a token (to use, sell, or re-lend) by using their balances in the protocol as collateral