



Wanlend: **The Crosschain Money Market Protocol**

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Abstract

Decentralized finance (DeFi) applications have taken the cryptocurrency and blockchain space by storm. Among all DeFi applications, lending and borrowing protocols capture the time value of assets, offering a safe, peer-to-peer, and positive-sum venue for users to utilize surplus assets or gain exposure to new assets without exchanging or selling assets. Current lending and borrowing protocols are mostly built on the Ethereum network and are expensive for average users due to the high gas fee. Moreover, the assets are limited to selected Ethereum-based assets. This paper introduces the Wanlend crosschain money market protocol for liquidity pool-based lending and borrowing, leveraging the decentralized crosschain capability, cheap gas fee, and layer-2 solution of Wanchain. The Wanlend protocol aims to bring DeFi lending and borrowing to all blockchains, breaking the last barrier for mass DeFi adoption.

keywords: lending, borrowing, decentralized finance, crosschain

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1. Introduction

Blockchain technology has laid the foundation for Web 3.0, thanks to the implementation of open, trustless, and permissionless decentralized networks. As a medium for asset exchange on blockchains, cryptocurrencies are gaining mainstream attention. Cryptocurrencies can be stored or exchanged for goods and other assets, much like traditional assets. Not surprisingly, the asset nature of cryptocurrencies has spawned financial applications, mimicking traditional finance systems. Such decentralized finance (DeFi) applications have shown certain advantages thanks to their trustless settings.

Lending and borrowing protocols have taken DeFi applications to another level. Using lending and borrowing protocols, users can put surplus assets to work and earn interests in return or borrow new assets and profit from market movements. Both activities happen in a peer-to-peer fashion, secured by collateral assets. In the first generation of lending protocols, such as ETHLend (now superseded by AAVE[1]), peer-to-peer lending and borrowing were secured by smart contracts. Lenders and borrowers have to be matched, similar to order matching in exchanges. Such matching may not occur in time, especially when the user base is small. New lending protocols, such as Compound[2] and AAVE[1], adopt an alternative pool-based strategy, where lenders deposit cryptocurrencies into a pool contract and the borrowers borrow directly from the pool, without the need to match with lenders. Despite this breakthrough innovation, several issues remain in current lending protocols:

- Interacting with lending protocols is prohibitively expensive. Currently, most lending protocols are deployed on the Ethereum network. The gas fee for interacting with smart contracts has escalated to hundreds of US dollars recently due to the high utilization and low transaction per second.
- Assets are limited to Ethereum-based assets. While there are wrapped crosschain tokens on Ethereum, almost all are trusted or semi-trusted, where users have to trust a single entity with their Bitcoin or other coins.
- Sub-optimal tokenomics for governance tokens. Almost all protocols have released their governance tokens as incentives for providing liquidity. Yet, the team members or investors take a significant stake in the token distribution, making the real owners of the protocol, i.e., the users, irrelevant.

This paper introduces Wanlend, a crosschain decentralized system for inclusive, borderless asset lending and borrowing. Wanlend aims to solve the issues above by putting users at the center of the protocol.

2. Wanlend as a solution for decentralized money market

The Wanlend lending and borrowing protocol forks the Compound protocol[2]. It leverages the fast proof-of-stake (POS) blockchain technology and crosschain capability of Wanchain[3] to build a first-of-its-kind crosschain-enabled money platform. As a decentralized public POS blockchain, the transaction per second (TPS) on Wanchain can be more than 1000 TPS, compared to Bitcoin's 7 TPS and Ethereum's 15 TPS. With the Wanchain mainnet 2.1.5 update, the gas fee for the transaction has reduced to 1 GWin (0.000000001 WAN or ~ 0.000000002 USD at the time of writing), which makes DeFi accessible to all users. The Wanlend protocol enables users to deposit and borrow WRC-20 tokens and the native WAN coins with dynamic interest rates calculated by economic supply and demand models. Currently, the WRC-20 tokens include Wanchain native tokens and the crosschain tokens, such as wanBTC, wanETH, wanEOS, wanXRP, etc. Those crosschain tokens are anchored to their native coins as secured by the 150%-collateralized storeman group nodes of Wanchain.



Figure 1: Wanlend protocol enables lending and borrowing of any crypto assets without interacting with a second party. Bob can deposit crosschain Bitcoin assets into the liquidity pool and earn interest if someone else borrows Bitcoin from the pool. At the same time, the deposited Bitcoin works as collateral and enables Bob to borrow other coins. Alice, on the other hand, is a fan of DeFi tokens and Bitcoin. She can deposit her WAN coin and then borrow the coins and tokens she likes. Alice does not need to interact with Bob for her to borrow the Bitcoins in the pool.

2.1 Lending assets

Instead of lending assets directly to a peer, where the users agree on the amount, expiration date, and interest rate, the Wanlend protocol removes the need for a counterparty. Figure 1 shows that the Wanlend protocol uses a pool-based strategy for aggregating assets deposited by the users. In the Wanlend protocol, **the lending asset amount, loan expiration date, and interest rate are flexible**. The users can deposit any amount of supported assets to the Wanlend liquidity pool, and the assets are aggregated for the borrowers. Borrowers pay the cost and interest to the pool, distributed to the lenders who supplied the borrowed assets. As long as the specific asset is not all borrowed, the lender can withdraw the assets at any time. In other words, there is no explicit expiration date for the loan, which is only possible with a decentralized liquidity pool. Lastly, the interest rate is calculated dynamically depending on the supply and demand.

2.1.1 Use cases

Asset lending allows HODLers to earn passive income even for non-POS coin or tokens. For example, a believer of Bitcoin can deposit Bitcoins to the Wanlend liquidity pool and earn interest, without the need to worry about losing the coins.

2.1.2 Interest rate

The borrow interest rate is calculated based on the jump rate model in Equation 1:

$$r_b = \begin{cases} r_0 + r_1 f, & \text{if } f \leq f_{\text{jump}} \\ r_0 + r_1 f + (r_2 - r_1)(f - f_{\text{jump}}), & \text{otherwise} \end{cases} \quad (1)$$

where r_0 and r_1 are the base interest rate and the interest rate multiplier before the jump point f_{jump} , and f is the utilization rate expressed as the ratio between the borrowed assets and the total liquidity of that asset. $r_2 > r_1$ is the interest rate multiplier after the jump point f_{jump} . r_0 , r_1 and r_2 will be adjusted based on voting from the Wanlend community via the governance protocol.

The supply interest rate is calculated based on

$$r_s = r_b f (1 - RF) \quad (2)$$

where RF is the reserve factor. The reserve takes a small percentage of the interest difference for project developments and risk coverage. The initial RF will be set to 10%.

An example interest rate r change concerning the utilization rate f is shown in Figure 2, where the jump point f_{jump} is set to be 0.8. From Figure 2, it is clear that when the utilization rate is high, the interest rate increases and more users will likely supply their assets to the pool; when the utilization rate is low, the low interest will also incentivize users to borrow assets from the pool. The supply and demand is automatically adjusted with the interest rate incentives. The jump mechanism incentivize the users to keep a certain level of liquidity in the pool such that suppliers can always withdraw their assets.

2.1.3 The wTokens

Whenever the users deposit assets into the Wanlend liquidity pool, they get the ownership wTokens in return. The wTokens represent shares of the liquidity pool for a specific

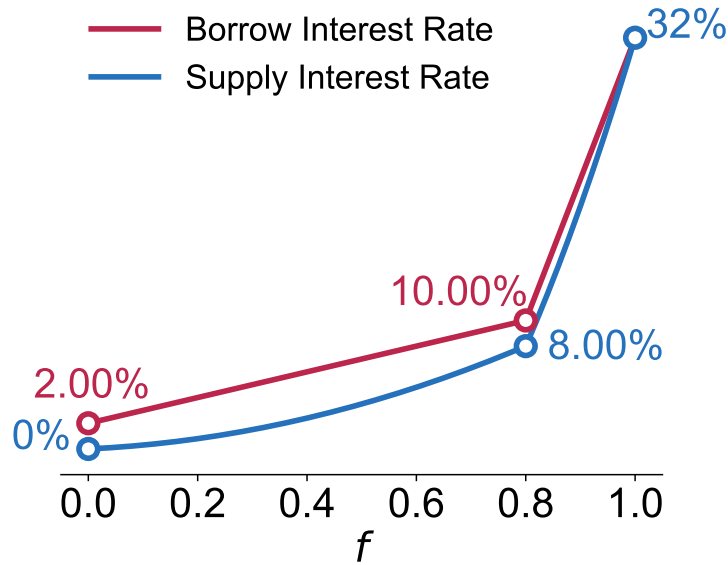


Figure 2: Interest rate r as a function of the capital utilization rate f . The base rate $r_0 = 0.2$ and the jump point is $f_{\text{jump}} = 0.8$. Before the jump point, the interest rate multiplier is $r_1 = 0.1$, and after the jump point, the multiplier becomes $r_2 = 1.1$. Here the RF is set to 0.

asset. For example, users who deposit WAN tokens will get wWAN. The wTokens can be redeemed to the original assets plus an additional amount from interest accumulation at any time if the liquidity pool is not exhausted. The wToken-to-asset exchange rate always increases with time since the borrowers pay interest to the pool, which all lenders share.

Assuming at time t , the total borrowing balance is B_t , then at the next time event, $t + 1$, the total borrowing amount accrues interest for this time period Δt with an interest rate of r_t . The total borrowing balance at $t + 1$ is

$$B_{t+1} = B_t(1 + r_t\Delta t) \quad (3)$$

The second term on the right-hand side is always positive. Hence when calculating the wToken exchange rate at any given time, the exchange rate is always greater than the time assets are supplied to the pool.

2.2 Borrowing assets

Assets borrowing on Wanlend have to be collateralized, meaning that the users will need to supply one or more types of assets and use those assets as the collateral for borrowing new assets. When a borrowing event happens, the borrowed assets are transferred to the borrowers' Wanchain address, and the floating interest rate is calculated. Similar to the lenders, borrowers can repay the loan at any time.

2.2.1 Use cases

The borrowed assets can be used to participate any activity on the asset blockchain. In addition to the obvious use case, borrowers can leverage the borrowed assets to time the market and profit from the market movement. For example, Bob uses his USDT stable coin as collateral to borrow one Bitcoin valued at \$50000. If he believes that Bitcoin will fall to \$40000, he can sell the borrowed Bitcoin immediately and then wait for the price drop and buy back to repay the loan. If this happens, Bob will have \$10000 profit without losing positions of USDT.

2.2.2 Borrowing capacity and over-collateralization

The user's borrowing capacity is calculated based on total value of the assets the user has deposited into the pool. For example, if Alice has deposited 1 BTC and 1 ETH to the pool with a total value of \$60000 USD, then she can borrow $60000\zeta_a$ asset a with the collateral factor ζ_a in the range $(0, 1)$. The collateral factor ζ can be adjusted for each asset class and can be determined via voting in Wanlend governance protocol. Currently the Wanlend protocol set the default collateral factor as 80%. Collateral factors less than one protect the protocol from risk. For less liquid assets, the collateral factors will be lower to minimize risks. At the V2 launch, the following collateral factors will be set:

- wanBTC, wanETH, wanUSDT, wanUSDC: 75%
- wanXRP: 60%
- WAN: 50%

2.2.3 Risk of borrowing and liquidation

Since the asset borrowing is based on collateral values, when the price of the collateral assets falls under the user's borrowing capacity or allowance, then the borrower needs to add more collateral, repay the loan using other funding sources or having part of the collateral liquidated. In the case of liquidation, anyone can repay some of the debt in exchange for part of the collateral at better-than-market rates. The maximum fraction of the loan that can be liquidated, or the close factor, is set to 50%, and the discount for liquidator is set to 8% at launch. In other words, borrowing assets has higher risk than lending. In the case of liquidation, a portion of the user's collateral asset is exchanged to the borrowing asset to repay the loan such that the outstanding borrowing amount is less than the borrowing capacity.

2.3 Asset pricing mechanism and asset support

Similar to the Compound protocol, Wanlend uses a price oracle that combines the top cryptocurrency exchanges for determining the exchange rate of an asset in the Wanlend liquidity pool. The prices of assets determine the borrowing capacity, liquidation, etc. Currently, the Wanlend protocol support 10 assets, including wanBTC, wanETH, wanXRP, wanUSDT, wanUSDC, wanUNI, wanLINK, wanSUSHI, WAN, PHX and WASP. In the future, the addition of new assets will be open to the decision from the Wanlend community via the governance protocol.

3. The WAND token and governance

In Wanlend V1, the parameters of the protocol are chosen by the team. With the upcoming release of Wanlend V2, we have overhauled the entire mechanism, aiming to give the protocol control to the community. The long-term goal for Wanlend is to form a decentralized autonomous organization (DAO). With this in mind, we introduce the governance WAND token and the governance protocol.

3.1 WAND tokenomics

The WAND tokens represent voting right on the governance protocol and will be distributed to the asset suppliers and borrowers on the Wanlend protocol. A total of **210,000,000** WAND tokens will be issued over three years, with the distribution rate shown in Figure 3.

A total of 85% of the WAND tokens will be given to liquidity providers, of which 3% or 6.3 million WAND, will be distributed to Wanlend V1 participants, and the remaining 82% or 172.2 million WAND will be distributed to the Wanlend V2 participants. There will be a time window of 3 months after the V2 launch for the V1 participants to claim the WAND reward (minimal claimable amount 1 WAND, and lender/borrower split the total reward at 4-6 ratio). In V2, lenders and borrowers will share the liquidity incentives at a 5-to-5 ratio. The remaining 15% WAND will be reserved for the Wanlend foundation and future partners for continuing the developments and growing the ecosystem.

The emission of WAND token follows a decreasing model as Bitcoin. The emission rate decreases by 25% every ~6 months over a 3 year time period. The WAND token distribution to each market will be proportional to an adjustable weight in each market. To incentivize early participants, users with leveraged positions, i.e., users who recursively supply and borrow assets from the markets, are allowed to maximize their WAND farming returns. However, this is subject to change considering the best interest of the project.

3.2 Wanlend governance

WAND holders will be able to submit proposals, delegate their voting right, and vote for decisions to move the project forward collectively. The following is a non-exhaustive list of governance parameters that the community can vote.

- Interest rate model parameter described in Section 2.1.2.
- Collateral factor for an asset described in Section 2.2.2.
- Addition of new assets to the liquidity pool.

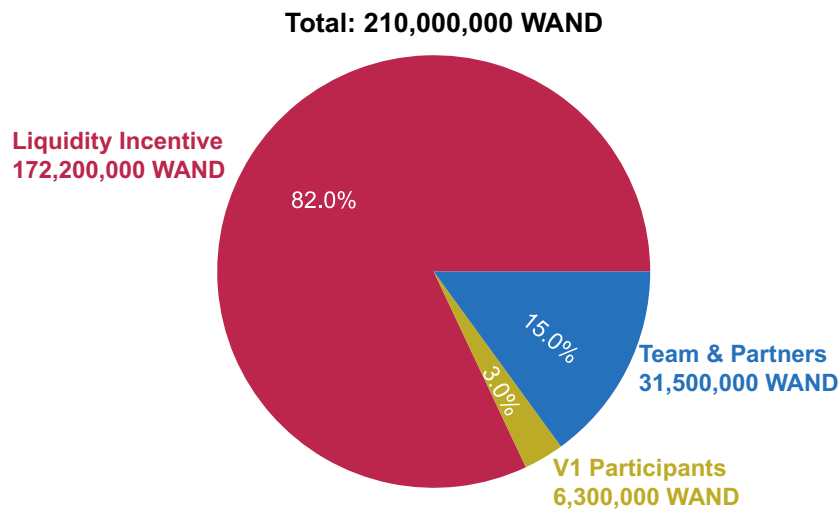


Figure 3: WAND token distribution. A total of 210 million WAND will be mined over 3 years. A majority (85%) of the tokens will be given to users who provide liquidity and borrow from the liquidity pool. The rest of the distribution will be reserved for growing the Wanlend project.

- The choice of price oracle .
- Markets upgrade and token migration.
- New functionality of the protocol.
- Adjustment of the emission rate of WAND token.
- Usage of the foundation WAND token.
- WAND token burn.
- ...

To avoid spam proposals, community members will need to hold or be delegated at least 1% of the WAND token supply or 2,100,000 WAND to submit a proposal. Any address with 10000 WAND will be able to create an autonomous proposal, which becomes a governance proposal after it receives 2,100,000 WAND delegations. After a governance proposal is created, the team and later the community will review the proposals for 2 days, then voting begins and lasts for 3 days. If a majority (>51%) and at least 8,000,000 votes are cast for the proposal, the governance proposal would be queued in time lock and can be implemented two days later.

4. Summary

The Wanlend protocol combines the previous experience from Compound and AAVE to build the first crosschain-enabled money market. The fast Wanchain blockchain enables the liquidity supply and borrowing at instant speed. In the future, with more crosschain assets enabled on Wanchain, we foresee Wanlend becoming the hub for decentralized lending & borrowing.

References

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