Polylend: A lending aggregator for Layer-2

(DRAFT V1.0)

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Abstract

As Ethereum 2.0 is expected to reach 3,000 transactions per second (tps)[1-2] and exceed ~2000 tps by Visa[1], the next stage of the crypto network emerges. The new Ethereum network will provide significant economic value[1-7] by payments[6,7], Decentralized Finance (DeFi)[3,4], and non-fungible tokens (NFTs)[1] that are slowly migrating from Ethereum Layer-1 to a more efficient Layer-2. Here we introduce an aggregated lending protocol, Polylend, built to optimize the lending process among various Layer-2 networks[5]: (1) It is focusing on a larger spectrum of Layer-2 assets as collaterals (e.g., DeFi assets, NFTs, and other longtail coins); (2) It will make the functions of collateral-repay and leverage accessible to mainstream users; (3) It strives to connect lending pools from multi-chains and Rollup solutions. We anticipate aggregating the growing but fragmented lending markets on the Ethereum blockchain, achieving an infinite expansion of liquidity and diversity by Layer-2.

Keywords: Polylend, Layer-2, Lending aggregator, Longtail assets, Liquidity, Polygon

Contents

1. Why Layer-2?

Slow Ethereum block confirmations and high transaction fees result in low scalability and poor user experience for the mass adoption of blockchain applications. Ethereum 2.0 is proposed to reach 3,000 transactions per second (tps) and exceed ~2000 tps by Visa, which may lead to the next stage of the crypto network with economic value beyond the boom and bust cycles. In particular, the three biggest developments in the crypto ecosystem present the economic power in 2020-2021, including payments, Decentralized Finance (DeFi), and non-fungible tokens (NFTs). All these decentralized applications (Dapp) are built on the Ethereum blockchain but are limited by its significant inefficiencies. In the near future, Ethereum is inevitably layered from the fundamental Ethereum asset layer, security layer, to the Dapp Execution layer based on a Layer-2 network.

Among all the Layer-2 solutions, both the Arbitrum and Polygon provide potential solutions to the problems prevailing in the current Ethereum ecosystem. They are improving to mitigate the Ethereum limitations. With one of them, the aforementioned Dapps could: (1) take advantage of Layer-2's scalability and flexibility, and (2) keep the Ethereum security and developer's experiences. The recent Total Volume Locked (TVL) on Polygon reached ~6 billion USD just within 2 months, which indicates its popularity and reliability as an Ethereum Layer-2 solution (Fig. 1). We anticipated that either Polygon or Arbitrum, or both, will connect or exceed the other forked Ethereum Chains (e.g., BSC or others; Fig. 1), and become the compatible dominated-roles in the near future.
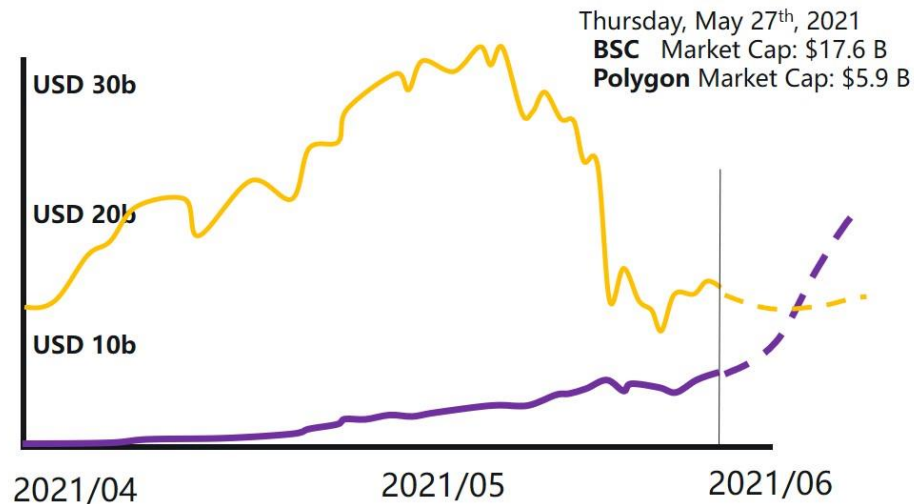
Figure 1 Total Volume Locked (TVL) comparison for Binance Smart Chain and Polygon over the past two months

(April-May, 2021). Note: Dash lines are predicted in the near future (Data from Debank)

2. Why Polylend?

The various Layer-2 solutions make Ethereum fragmented and thus users feel frustrated in a selection of their lending platforms and impossible to shift their collaterals and assets from one chain to another. The developers like AAVE, Curve, and Sushiswap have deployed their Dapps on Polygon, meanwhile, Arbitrum attracts more than 100 apps to test on it. In particular, AAVE as a perfect lending protocol is enhanced by Polygon, which provides expected ETH 2.0 experience of fast block confirmations and low transaction fees. Undoubtedly, as a top lending platform, AAVE successfully launched a new branch on Polygon with nearly 3.8 billion USD locked, in addition to AAVE V1 and AAVE V2 running on ETH 1.0. As traditional users on ETH 1.0 understand the space and become users on Layer-2, they will migrate more volume and more types of Ethereum assets into these Layer-2 networks, which is key for the future of Ethereum. More broadly, developers for ETH 2.0 (e.g., NFT projects) contend that Layer 2 solutions could help release their liquidity technically and financially. All these changes indicate future growth of a variety of ETH

assets and financial service demands on Layer-2 that requires more differentiated lending platforms in addition to the current versions of AAVE, e.g., for the longtail market. We thus propose Polylend to explore the potential of the lending ecosystem focus on aggregating various Layer-2 solutions. We start to deploy our protocol on Polygon that aims to be a specialized framework to connect all the Ethereum-compatible networks.

3. The Architecture of Polylend Protocol

Polygon Matic Network provides an upgraded Plasma framework and keeps improving for fast and extremely low-cost transactions with finality on a mainchain of Ethereum. It is envisioned that the Polylend protocol on Polygon could be used to aggregate multiple lending pools to obtain low-cost liquidity at all times. Deposits could be shifted between various pools as rates change without worrying about the risk from unbearable-long block confirmations. The major three components of the Polylend protocol are listed as below (Fig. 2):
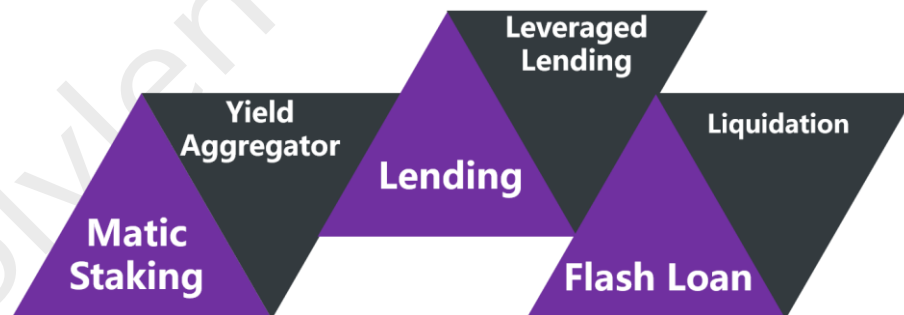

Figure 2 The major components of Polylend protocol on Polygon blockchain

3.1. Matic Staking

Matic holders can earn staking rewards, thereby increasing their Matic holdings, by simply staking their Matic tokens with any one of the 100 active validators on the network. To stake Matic tokens

the holder must send the Matic to the MetaMask wallet. However, once you've transferred your tokens to your MetaMask wallet, you may proceed with staking your tokens on the Ethereum network instead of the Polygon Matic network to earn staking rewards. As the Ethereum network takes time and costs high transaction fees that are unacceptable for smaller holders of Matic, it becomes a barrier for these Matic holders to withdraw the Matic and invest them in the Polygon network. We will build a validator node on the Polygon Matic network and optimize a pool for the process of migrating Matic to Ethereum and stack, which is a reasonable and rational staking service for all the Matic holders on the Polygon network (Fig. 3). Users will benefit from: (1) users on the Polygon network could stake Matic to earn Matic. They won't worry about the gas fees by Ethereum network and avoid the inconvenience to switch from Polygon network to Ethereum network; (2) As users of the Polylend, stackers will receive extra earning by receiving incentives of Pcoins from our protocol.
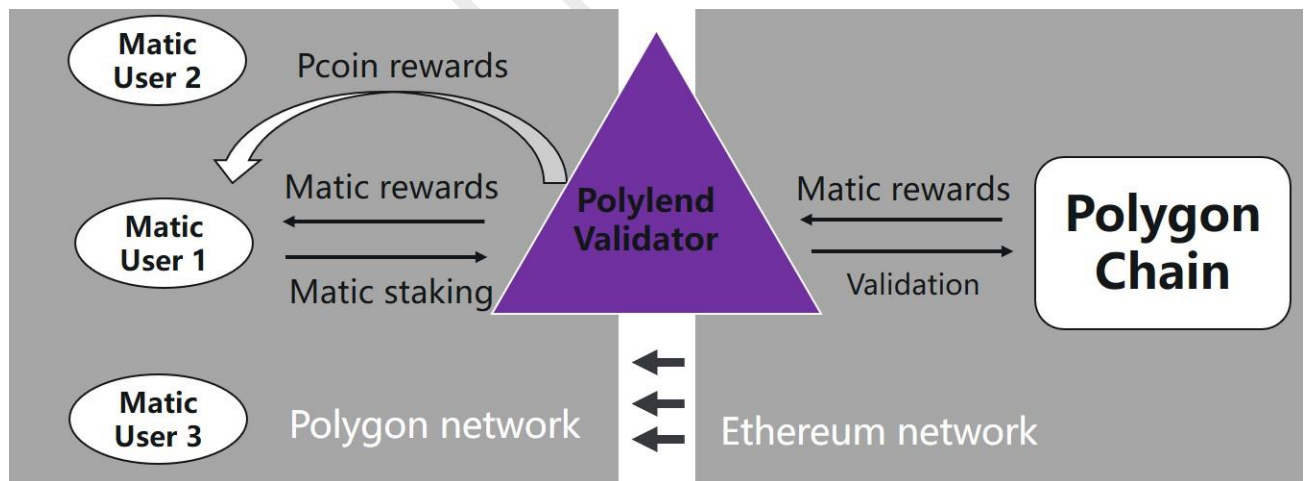

Figure 3 The Matic staking on Polylend and incentives for users

3.2. Lending

AAVE and Compound provide the classical versions of lending protocols for the industry. The shift from a decentralized P2P lending strategy to a pool-based strategy innovatively boost the DeFi lending market. Loans rely on the pooled funds, and rates are calculated based on the amounts borrowed and their collateral. Although there are different managing strategies on the pools, liquidations, and configurators, AAVE and Compound share the same theory behind the protocols for implementing lending by smart contracts. We will improve several aspects of the implementation in advance of the classical versions (Fig. 4):

(1) **Optimized rates for the mainstream coins**. This function is similar to Yearn Earn, which is a leading lending aggregator that optimizes the interest accrual process across multiple protocols to obtain the highest rates on Ethereum 1.0.

(2) **Focusing on a larger spectrum of collateral assets**. It is common to see the current existed Dapps of lending overlap in the most popular collaterals (~20), including stable coins and mainstream coins. The long-tail coins, however, account for most of the list on Coinmarketcaps with low volumes that are in demand by a large customer base. These coins and NFTs with low sales volume present a significant lending market opportunity. Polylend will acknowledge the potential of such coins in lending using a specified evaluation model, which would not be possible without the booming of AAVE and compound and efficient Layer-2 network.

(3) **Centralized price oracles**. Most of the current lending platforms apply Chainlink as a decentralized oracle network to feed the collateral prices. These smart contracts are pre-specified agreements on the blockchain that evaluate price information and automatically calculate them among the supporting nodes, which usually cause unbearable time-delay (>15 s) on collateral liquidations. The oracles require two fundamental features, one is trustworthy price, and the second is instantaneous price. Bitmex has already proven a centralized oracle from multiple major markets could greatly support the swap trading. As long as the contract is open to the public, the data could be more accurate, reasonable, and trustworthy than decentralized oracles.

(4) **Penalty for liquidation**. The liquidators are underexamined actors in the DeFi space being handsomely rewarded for keep markets solvent. Secured loans can work well when the value of the collateral exceeds the value of the loan; however, when the value of the collateral drops, rational borrowers are now incentivized to abscond with the loaned asset, leaving lenders potentially underwater. In particular, the value can plummet in a matter of seconds. To mitigate this risk, lending protocols typically require at least 115% collateralization, leaving plenty of buffers (15%) before collateral drops below the value of the loan. The 15%, is such a penalty for lenders and rewards for liquidators to keep the system solvent. Aggregate proper DeFi swaps and lending pools could provide the necessary system liquidity well address the solvent problem without this ridiculously amount of penalty. It is one of our main motivations to propose this protocol to increase the financial efficiency, namely, ~15%.
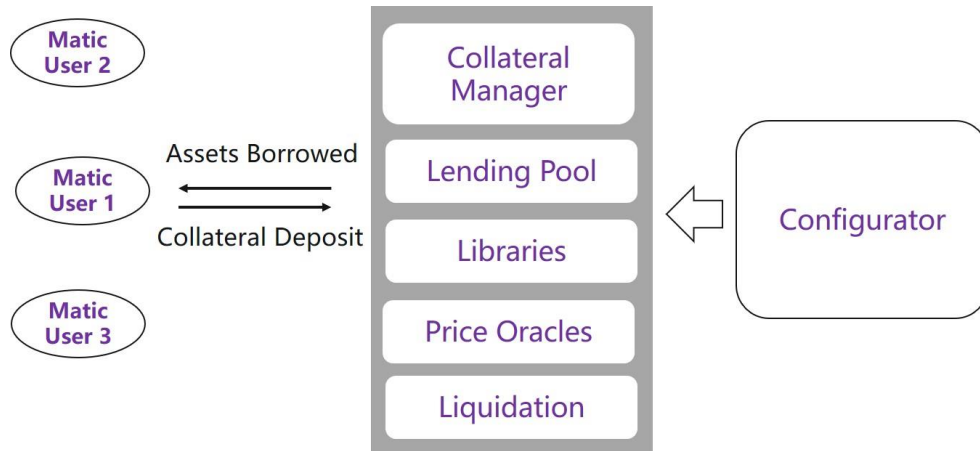
Figure 4 Polylend lending protocol

3.3. Flash Loan

A flash loan is a completely new type of uncollateralized lending that has been provided by several DeFi protocols (e.g., AAVE, dx/dy, Uniswap) based on the Ethereum network. In a flash loan, there are two unique features: (1) the borrower must pay back the loan before the transaction ends, otherwise the smart contract would reverse the transaction; (2) the borrower has to call on other smart contracts to perform instant trades with the loaned capital instantaneously before the transaction ends (usually just a few seconds). It has been used in arbitrage and collateral swap, while only coders could take advantage of it. Arbitrage opportunities and collateral swap demands exist in one form or another in all crypto markets, which build the pyramids of the TVL. Flash loan functions should be made accessible in the lending protocol without a request of coding, and thus to help boost the liquidity and reduce the liquidation at high cost in the extreme market.

3.4. Yield Aggregator

The yield aggregator is a platform that supports a variety of Defi protocols. It can move the warehouse between various Defi protocols that provide liquidity mining to help users obtain more rewards. It uses smart contracts to perform the functions of traditional fund and financial

management. When users store their digital assets in the aggregator, the aggregator's smart contract will automatically find the most profitable item in each loan agreement, transfer the assets to provide loan funds and obtain income.

In addition, the yield aggregator will return the renewal fee and the token Pcoin of the transaction to the liquidity provider. The significance of the revenue aggregator has three aspects. The first is to reduce user operations, the second is to reduce user fees, and the third is to increase user revenue.

4. Aggregation of the Layer-2 networks

Multi-chain wallet control. The Polygon Matic Network uses a state-based architecture on an EVM (Ethereum Virtual Machine), so it does not require payment channels to be opened between two parties. Any valid Ethereum address is a valid Matic Address and a receiver does not need to be on the Matic chain to receive payment. Users could retrieve the payments on the mainchain or spend it in the ecosystem on the Polygon Matic Network (Fig. 5).

Ethereum lending-pool control. The Polygon Matic Network combines Ethereum's security, interoperability, and developer experience. All the existing Ethereum tools are compatible in this network with message exchanging, including Metamask, MyCrypto, and Remix. It provides the core components and tools to join the new applications on either stand-alone chains or secured chains. The growing set of modules could help developers connect future expansion solutions, e.g., rollups.
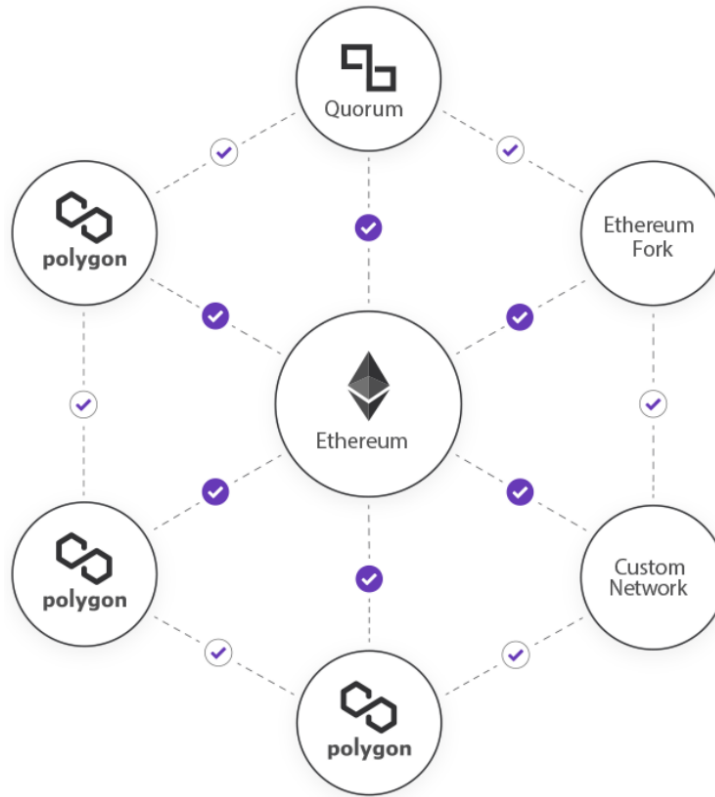
Figure 5 Polygon framework to connect all the Ethereum-compatible networks (Adapted from Polygon Lightpaper, 2021)

<u>Longtail assets control</u>. The explosive growth of the DeFi market presents more and more lending needs, which we will produce an unlimited number of customizable lending pools, including the NFTs and DeFi assets. For the detailed evaluation model for longtail assets, we will develop a comprehensive market model to test the collateral potential/ratio of each particular longtail asset. This strategy will expand Polylend as a lending market featured by liquidity, diversity, and scalability.

5. Positioning

The most outstanding feature in Polylend is the large spectrum of crypto assets including longtail coins and optimized functions for collateral repay and liquidations (Table 1). We note a sharp

increase of TVL on Polygon with only stable coins and up to 5 crypto coins. As discussed above, this shift of crypto assets to Layer-2 can be attributed to the expansion of the DeFi products and the booming of financial demands. We would aggregate all of these growing but fragmented lending markets to achieve the infinite expansion of liquidity and diversity in the tide of Layer-2.

Table 1 Positioning of Polylend as a lending aggregator

	AAVE	Compound	Curve	Maker	Polylend
Stable coins	●	●	●	●	●
Mainstream coins	●	●			●
Longtail coins					●★
Flash loan	●★				●
Collateral repay	●★	●★	●★	●★	●
Leverage					●★

★ Limited functions

6. Tokenomics

a) *Economic model*

In our economic model, rewards will be determined fairly and provided transparently for all depositors and lenders, as well as community participants. These ecosystem rewards can be classified into three categories and tokens can be used as a means of incentive for the ecosystem: (A) the users of the Polylend protocol, (B) volunteers that support the communities, and (C) holders of our asset tokens. Regard with the platform income, the majority (60%) will be used to buy our

asset tokens from the market and burn for a long-term deflation, which is an alternative entitlement to dividends; The 20% goes for operation and the rest 20% is for the fund as a backup for risk.

b)　Token distributions

The Polylend Coin (Pcoin) is the native currency of the Polylend protocol and is required to participate in our protocol activities via using the services. The detailed plan of the Pcoin release (Fig. 6) will be listed on our website Polylend.io soon.
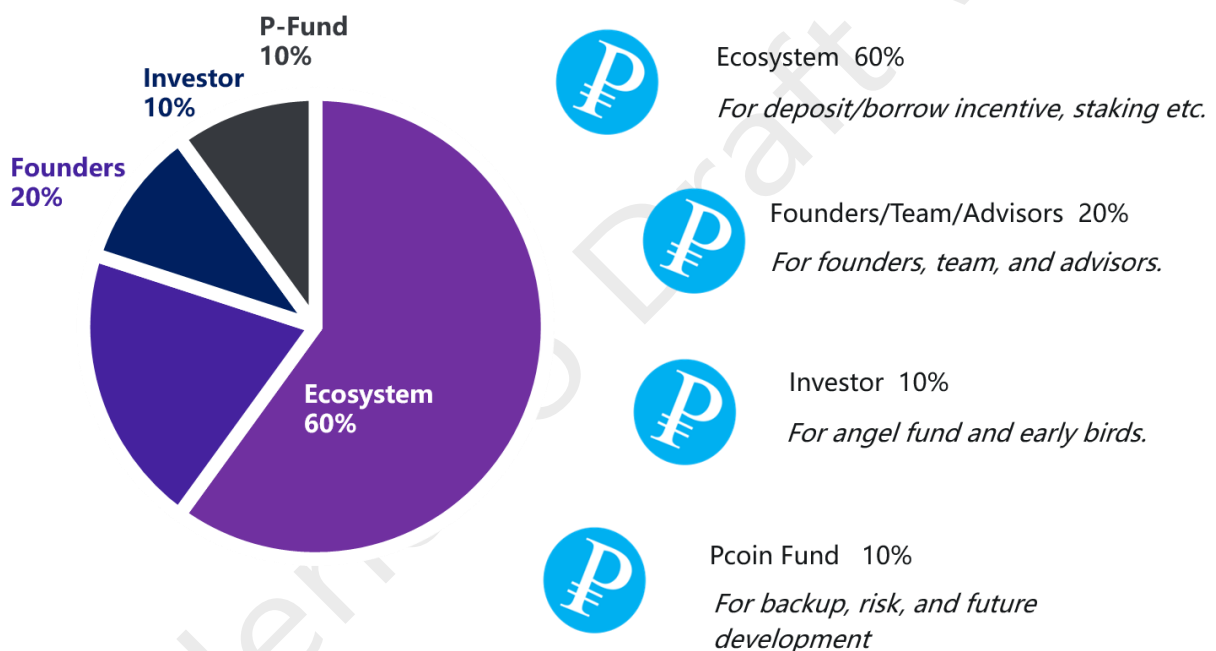

Figure 6 Pcoin distributions （to be decided）

7. Roadmaps

We envision that the Polylend protocol will dynamically adapt to the development of the Polygon Matic Chain in the short term and the Ethereum layer-2 ecosystem in the long term. We've evaluated the strength of the Polygon in three steps of examining its compatibility: TVL on the Polygon Matic Chain, the integration of side chains, and decentralized applications deployed on

the chain. To fully take advantages of the Polygon, we schedule our recent roadmap (Fig. 7) for Polylend as below:

(1) Matic validator mining.

(2) Lending protocol.

(3) Evaluation of ERC20 assets and NFTs for lending pool.

(4) Flash loans for collateral liquidation and integration of multi-chain assets.

(5) Leverage and earning opportunities.

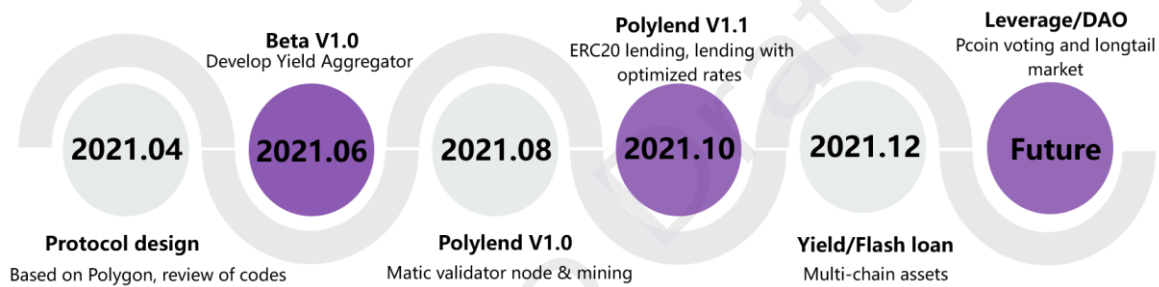(6) DAO and expansion to longtail market.

Figure 7 Roadmaps of Polylend

In summary, in the present protocol, we demonstrated that the aggregated lending pool with a larger spectrum of assets can boost global crypto lending to new heights in the DeFi wave. This Polylend protocol aims to be such a lending platform for Layer-2, by connecting Layer-2 solutions and providing accessible lending functions, to achieve the infinite expansion of DeFi liquidity and diversity.

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