Parallel Protocol–Next Generation Syns v5

1 Abstract

Parallel protocol is a decentralized synthetic asset issuance protocol built on cross chains (Ethereum, BSC, Solana etc). the synthetic assets supported are almost any ”assets” including FX swap, commodities, derivatives, composite index and even sports spread betting. Participators are stakers, liquidators and traders in Parallel. For the purpose of balancing control of both the liquidity risk and market making risk, Parallel combined the a global debt model and user debt model. Moreover, in order to mitigate collateral price volatility risk, Parallel employs a multiple assets collateral mechanism and a automated clearing system which is an automated–market–making like mechanism to offer rewards to liquidators once the collateral debt ratio is below a certain threshold. Stakers take only limited risks and they are incentivised to stake their tokens as they are paid a pro–rata portion of the fees generated through activity on Parallel and airdroped PARA by the system. Parallel also provides hedging tools for stakers to hedge positions. dToken as a debt and incentive unit is a designed token to calculate the system debt and distribution of incentives. Traders could participate in market making and arbitrage trading on the exchange without collaterals. PARA(Parallel Network Token) as the token of Parallel is used to govern the protocol, coin Syns and used as transaction fees.

2 Intorduction

2.1 Background

In the past year, decentralized finance (DeFi) has gained enormous recognition, especially for Decentralized Exchanges (Dex), Loan Agreement, and Yield Aggregators. Analogous to traditional finance, DeFi’s significant potential lies in financial derivatives, which occupy the vast majority of the financial market.

Synthetic assets are a type of financial derivatives of which value is derived from the difference between underlying assets’ prices and contractral prices. Buyers and sellers trade contracts that track the asset prices for difference such as CFDs and spread betting.

In decentralized finance (DeFi), synthetic assets are tokens that represent financial derivatives in digital form. It has unique advantages: 1) creation without permission; 2) free transfer and transaction; 3) no centralization/counterparty risk; 4) liquidity creation. With any asset or data that has its metewand can be linked to blockchain in the form of synthetic assets, synthetic assets therefore has unlimited prospects.

2.2 Previous works

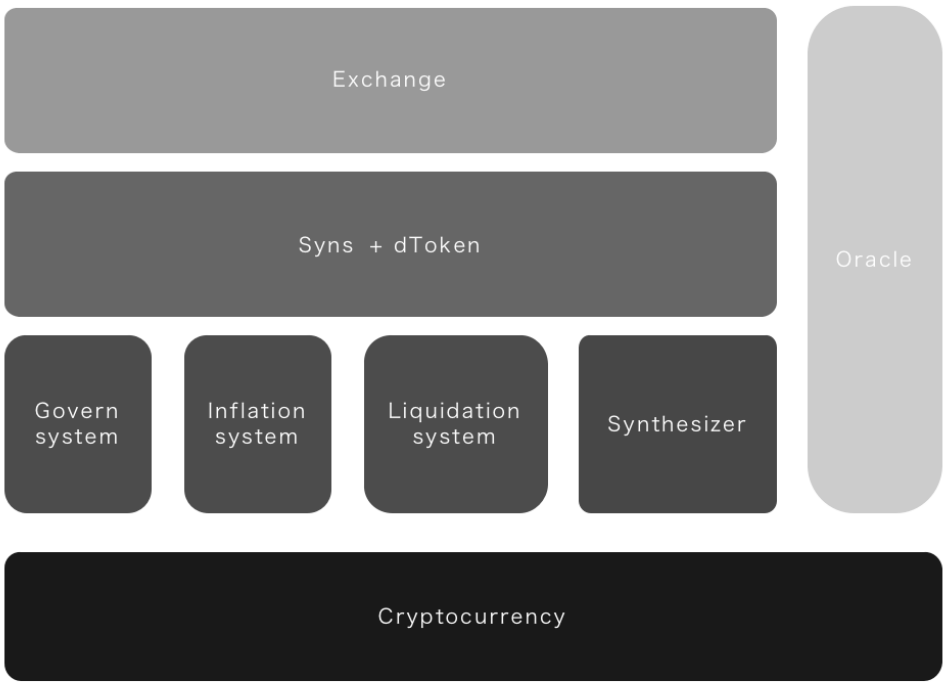
At present, several state of art synthetic asset projects can be categorised to two types according to the degree of customization and whether the agreement solves the liquidity of synthetic assets. The representative ones are Synthetix[1] and UMA[2].

Synthetix is an agreement to create a global pool of funds for synthetic assets on Ethereum. It is a standardized derivative that can promote creation and trading of various assets (including cryptocurrencies, stocks and commodities), all of which are completed on chains. Furthermore, the tokens that track assets prices can be traded in Synthetix's ecosystem. Users are only allowed to lock SNX as an endorsement of synthetic asset positions in return for transaction fees and token airdrops. The market value of SNX limits the scale of the entire system, and the adoption of a single asset and delayed settlement mechanism can easily lead to extreme risks such as a death spiral. Although Synthetix solves the liquidity problem (global debt model), it essentially makes stakers become market makers of synthetic assets and thus bear market-making risks.

UMA is a customized synthetic asset protocol; that allows any party to recreate traditional financial products, cryptocurrency-based products and more. Through UMA, two counterparties can create arbitrary financial contracts together without permission. These contracts ensure security through economic games (collateralization). UMA can realize highly customized synthetic asset transactions, and using a personal debt model avoids the system from assuming market maker risks; however, it is difficult to increase the liquidity of non-standard assets, and it will face long-standing issues such as insufficient liquidity.

3 Parallel protocol

Parallel protocol is a new synthetic asset protocol. The key components of the system include Synthesizer, Exchange, Govern system, Clearing system, Inflation system, and Oracle, as shown in Figure P1. The following chapters will introduce the entire system based on the key components.



P1. System architecture

3.1 Synthesizer

Users collateralize their assets (encrypted or other types) to coin synthetic assets, they obtain **Syns** and **dToken** (system debt unit, detailed in section 3.2). For example, the formula for users to collateralized DOT to issue dUSD is as follows:

$$\text{dUSD.amount} = \text{DOT.amount} * \text{DOT.price} * 1/CRatio \quad (3\text{–}1)$$

Among them, $CRatio$ (collateral ratio) represents the collateral rate, and $1/CRatio$ represents the issuance rate. The minimum value of the collateral rate for each asset is different, and the user can set it freely. Assuming that the price of DOT is 10 dollars, *CRatio(DOTmin)*=200%, and the user is set to 400%; then user pledges 100 DOT will issues 250 dUSD.

The collateralized DOT is transferred to the contract. When the user needs to withdraw the DOT outside of the position, the contract will determine the amount of DOT that can be transferred. i.e.

$$\text{transferable(DOT)} = (\text{DOT.amount} * \text{DOT.price} - \text{allValue(dToken)} * CRatio)/\text{DOT.price} \quad (3\text{–}2)$$

3.2 Debt

The issuance of **Syns** by users is equivalent to the issuance of debt, which is represented by **dToken** (there are two types of synthetic assets: standardized and customized, only standardized assets are issued to have **dToken**). **dToken** is a debt unit with dUSD as the unit of valuation and a voucher for receiving system inflation incentives. When the total system debt fluctuates, the denomination of **dToken** will also change accordingly. The total debt of the system is the sum of the value of all issued **Syns**:

$$\text{TotalDebt} = \sum_{k=1}^{n} Syn_k * price_k \quad (3\text{–}3)$$

The debt value corresponding to **dToken** is the ratio of the total debt of the system to the number of **dToken**:

$$\text{unitDebt} = \text{TotalDebt} / \text{dToken.supply} \quad (3\text{–}4)$$

dToken is a certificate for obtaining system inflation incentives. Users hold **dToken**s. As time goes by, the number of **PARA**s anchored by these **dToken**s will increase. The number of **PARA** corresponding to the user's **dToken**s is derived from the following formula:

$$Index_{a,n} = S/dToken.supply_{a,n} \quad (3\text{–}5)$$

$$\text{totalParalleldrop} = account(dToken) * \sum_{k=1}^{n} Index_{a,k} \quad (3\text{–}6)$$

In formula 3–5, *S* represents the additional issuance of **PARA** in each block; Index represents the number of **PARA** that a **dToken** gets airdropped at a certain time *t*; totalParallelismdrop represents the total amount of **PARA** that the user can receive.

3.3 Exchange

The system has a built–in native exchange. As there are two types of **Syns** trading in the system:

1) Standard **Syns**

A stanadard **Syns** transaction, i.e. dUSD to dTSLA, consists of four steps:

1> Destroy dUSD, reduce the dUSD balance of the wallet address and update the total supply of dUSD;

2> Determine the exchange amount based on the exchange rate, calculated based on the price of each currency;

3> Charge transaction fees (i.e. 0.3% of the transaction amount, which can be modified through the govern mechanism), update the total supply of dUSD to be the amount minus the fee (in dUSD);

4> The remaining 99.7% is issued by dTSLA's smart contract to update the wallet balance and the total supply of dTSLA.

As can be seen, a transaction converts debt from one Syn to another Syn of equivalent value in the system. Therefore, the transaction can be carried out without the counterparty. This mechanism brings two advantages: First, no counterparty reqiured means that **Syns** has unlimited liquidity (except for some **Syns** with special transaction attributes); second, equivalent exchange means that there is no need to record debt changes in the debt pool.

2) Customized **Syns**

The system adopts automated market making mechanism (AMM), a similar way of dealing with liquidity in uniswap[3]. Stakers and Syns holders could be liquidity providers, who share the transaction fees and extra airdrop incentives form the system. As an alternative, the system also could provide tools to explore liqidity in other DEX such as uniswap and pancakeswap.

3.4 Clearing System

When the ratio of the staker's collateralized assets to debt is less than 150% (such as ETH), the system will publish the position and give the liquidator a certain liquidation reward (r>1), by using trading robot (hawkesbot) to pend order quiries. The rules are: 1)quiries that has the lowest price is first served, 2)if same price then first come first served, and 3)the remaining assets will go to the original staker.

For example, the staker pledged eth worth 1600USD to synthesize 1000USD dUSD. Now the debt has risen to 1067dUSD, and the collateralized ratio is less than 150% which triggers the clearing system. The liquidator spends 1067dUSD to close the position with a return of 1.1 times (in the form of market quiries) and obtains eth worth 1173.7USD, then the remaining eth worth 426.3USD is returned to the staker.

To avoid liquidation, stakers can increase collateralized assets, reduce debt, or withdraw from the system. Repayment of debt requires the destruction of the **dToken** generated and its corresponding dUSD. Thus, depending on the profit and loss of the system, the stakers may need to repay more or less debt.

The process of clearing debts is divided into the following three steps:

1) The Parallel smart contract determines its debt balance and deletes it from the "debt register".

2) Destroy the required amount of **dToken** and its corresponding value of dUSD, and update the total supply of **dToken** and dUSD and the balance of **dToken** and dUSD in the staker's wallet.

3)Unlock the corresponding amount of collateral, which the staker can obtain.

3.5 Oracle

The price of all synthetic assets in the system, the settlement price of collaterized assets, and the transaction price of **Syns** are provided by the oracle. Therefore, the oracle is critical to the system, and the risks from the oracle need to be minimized. The system selects the most developed and popular oracles in the industry to perform secondary processing on their data as the source of information. In particular, the system makes decisions on uses of oracles utilizing the voting mechanism.

3.6 Governance

Users, holding **PARA,** will vote to form a governance committee, a supervision committee, and a finance committee. These DAOs propose and vote on the system's critical parameters, oracles, upgrades, types of collaterals and synthetic assets etc. Moreover, users who participate in the voting will be rewarded by **PARA.**

3.7 Security Pool

The system builds a security pool to deal with the risks of system insolvency which might be triggered by a black-swan type of events. Its funding comes from four parts:

1) the transaction fee;
2) system inflation;
3) crypto-assets from the project organizer;
4) crowdfunded assets.

The funds aforementioned will be used as liquidity supply or managed by third-party, which is likely to generate stable income. This income will be all distributed to the crowdfunding users, and thus they bear the risks of loss of net values.

3.8 Ecomonic Model

In order to create a vibrant community, and to promote a circular economy, the system incentivizes pecific behaviors of platform participants :

For stakers, various measures are taken to promote collateralizations and synthesis: Firstly, the transaction fee incentive. The transaction fee generated by trading of **Syns** is directly used to destroy the system debt. Secondly, the system inflation incentive. The additional issuances of the tokens are allocated to users who hold **dToken**. Thirdly, liquidity providing for specific **Syns** (such as dUSD or dETH) will be rewarded additional inflation incentives, which come from 5% of system inflation. Fourthly, for a tailor-made standard synthetic assets such as XccySwap (currency swap), the transaction fee will be distributed to the stakers (70%) who are involved in the transaction and all other stakers (30%).

For the liquidator, in order to encourage the liquidator to buy in a risky position, the position will be auctioned at discount prices;

For traders, the system will airdrop a portion of tokens to reward trading activities. According to different types of synthetic assets, the system adopts a global debt model and a user debt model. As to the former, all stakers become the counterparty to the trader and bear all the debt risks of the system; As to the latter, the system provides market-making bots (hawkesbot) for traders and stakers to match the trades. In addition, based on different synthetic assets, the trading bot help to explore liquidities on other exchanges (CEXs or DEXs) . The stakers will choose their way to participate in the system according to its risk preferences.

4 Core concept

4.1 Syns

Syns is a token that represents financial derivatives in digital form. When users holding the designated tokens use ParallelMint, a dApp that interacts with the Parallel smart contract, to collateralize their assets or tokens, **Syns** (usually dUSD) are generated, and its value usually comes from the over-collateralized assets. **Syns** supported by the system includes two major categories, standardized and customized assets. The former includes dBTC, dETH, dAPPL, dS&P500, dXAU, etc., and the latter includes dGas, dGME, dNFT, etc., which can be added, converted or deleted through governance mechanisms.

4.2 PARA

PARA is the native token of the system. Its functions include three aspects: 1) As a collateralizd asset, **PARA** is used to issue **Syns**; 2) As a governance right, **PARA** is used to vote or to initiate a proposal to determine the specific parameters, upgrades, and colateral asset types, etc.; 3) As transaction fee, the trader uses this to deduct the transaction fee when trading.

After the official launch, 30 additional **PARA**s will be issued in each block (the first year, i.e. on BSC), and the inflation rate will decrease by 50% year by year. The distribution method of the newly added **PARA** is:

1) The stakers who pledge assets to issue **Syns** get 80% of the total amount, and it is distributed according to the proportion of the **dToken** held by the stakers to the total **dToken** of the system.

2) Foundation account 10% of the total amount obtained is used for the continuous development and maintenance of the system.

3) 10% of the total amount obtained by the ecological account is used to develop sustainable ecology and the construction of the security pool and liquidity pool.

4.3 Collateral model

The system uses an over-collateralized model to support a variety of assets. The system sets up multiple fund pools and selects objects with relatively stable prices: BTC, ETH, DOT, Link, the platform tokens BNB, HT, OKT, and **PARA**. Each fund pool sets the collateral ratio according to the volatility of the collateral: i.e. ETH is 200%, DOT is 400%, and **PARA** is 800%. The uses of collaterals and the types of colaterals can be utilized are voted through the governance mechanism.

4.4 Debt model

The principal idea is that stakers sell the debt when **Syns** are minted, and the system buys the debt. According to the types of **Syns**, there are two debt models: the global debt model and the user debt model. 1) As to the global debt model, staker's standardized **Syns** will change the system's debt, more importantly, the stakers' collateral ratio is the ratio of collateral assets over her debt ：For example, if a staker issues dUSD worth 100 USD, then her debt is 100 USD, and the total debt of the system increases by 100 USD. When the staker wants to exit the position to unlock the collateral, he needs to destroy

Syns to buy back the debt. As can be seen, the user needs to destroy 100dUSD to retrieve ETH (in a simple case, when the system debt has not changed).

In a multi-user scenario, suppose that Andy and Bruce issued 100 USD worth of dUSD simultaneously, Michael bought 100dUSD from Andy and used it to purchase dTSLA (unit price 100 dUSD). Bruce was just holding 100 dUSD and did nothing. When the price of dTSLA drops by 50%, the debts of the system and users will change as follows:

Action/Event	Andy	Bruce	Michael	system debt
Mint	100dUSD	100dUSD	–	200dUSD
Michael buys dUSD	0dUSD	100dUSD	100dUSD	200dUSD
Michael buys dTSLA	0dUSD	100dUSD	1dTSLA(100dUSD)	200dUSD
dTSLA drops 50%	0dUSD	100dUSD	1dTSLA(50dUSD)	200dUSD
Michael sells dTSLA	0dUSD	100dUSD	50dUSD	150dUSD
debt	75dUSD	75dUSD	0dUSD	150dUSD
PnL	+25dUSD	+25dUSD	-50dUSD	+50dUSD

P2. System Debt Flucuations

When the issued Syns' value in the system changes, the system's debt and each staker's equally allocated debt also changes. In the above example, the price of dTSLA drops by 50%, the total debt of the system drops by 50dUSD, and the debt equally shared between Andy and Burce becomes 75dUSD (from 100dUSD). Michael's position of being long in dTSLA resulted in a loss of 50dUSD. Bruce did nothing, and the gain was due to the decline in system debt, and the final profit was 25dUSD. When the system debt rises, Bruce will have to bear the risk of loss, or he has to actively trade his positions by utilizing hedging tools provided by the system.

Stakers' customized Syns does not change the debt of the system, neither do bear the risks of rising system total debt. These stakers thus cannot enjoy the system's inflation and incentives. For example, a staker issues dGAS (Ethereum or gas index of a public chain platform). the system provides market-making bots (hawkesbot) to help issuers explore liquidity on designated CEX or DEX, and the system will provide market makers with airdrop incentives for specific Syns trading pairs.

When a staker exits the system, before unlocking the collateral, he needs to destroy Syns to buyback his debt. Unlike the global debt model, the collateral ratio of the stakers is the ratio of collateral assets over her synthetic assets.

4.5 Hedging tools

One of the metrics to measure the development level of a financial market is to see if it can provide ample hedging tools and means. For the afore-mentioned two types of assets, the system has designed a variety of hedging tools help participants managing their risks: For standard sythetic assets, they need to watch out the system debt. There are designed system debt indexes, debt volatility indexes, etc., to help guide stakers to hedge the risk; For customized assets, the system provides hedging tools on or off the

chain, including composite indexes related to the customized assets in the system, combination tools for joint third-party projects, and traditional hedging tools.

Conclusion

Parallel protocol is positioned as a cross-chain synthetic asset platform, which will be deployed on multiple public chains and interconnected through cross-chain bridges. Synthetics have enormous potential: Firstly, adding a variety of high-quality collateral assets, rich trading pairs and fully functional hedging tools provide for the system, improving its security, practicality, and scalability. Secondly, **dToken** is used to tokenize debt and to optimize the system's accounting system as well as the utilization rate of funds. Thirdly, By employing the global and user debt type balances the stakers' participation risk preferences, which greatly ensures the user experience. Fouthly, by optimizing the instant clearing system and increasing the security pool, the risk tolerance of the system is improved in multiple dimensions. Last but not least, the realization of fully decentralized governance will increase the inherent vitality of the agreement and ensure the long-term sustainable development of the system.

References

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[2] UMAprotocol https://umaproject.org/UMA-whitepaper.pdf
[3] Uniswap *Uniswap v3 Core