

Crafting Finance

Whitepaper

version 0.5

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1. Introduction

Crafting Finance is a synthetic asset issuance protocol and decentralised contract trading exchange based on the Polkadot contract chain. It natively supports multi-token collateral, including the token CRF issued by Crafting Finance, Polkadot (DOT), Kusama (KSM), Bitcoin (BTC) and Ethereum (ETH), and synthesizes any cryptocurrencies or stocks, bonds, gold and any other off-chain assets directly through smart contracts and oracles. Users can forge a certain synthetic asset, such as the US dollar, by collateralizing supported tokens, and automatically have a long position in the asset. Users can also convert minted assets into other assets through the trading platform, so as to realize the purpose of shorting the asset and longing other assets. The assets minted by all the users correspond to the liabilities of the entire system, and the proportion of each user's liabilities has been determined at the time of forging, so that their respective profits can be calculated. Because such a collateral pool model does not require a counterparty, it perfectly solves the problems of liquidity and trading depth in decentralised exchange(DEX).

The main functional modules of the entire system are Forge and Kingsman. Forge are where all synthetic assets are minted. Kingsman is the decentralized contract exchange using sharing debt pool trading mode. Other important modules of the system include collateral pools, fee pool, interest pool, and oracles.

2. Major Modules

2.1. Forge

2.1.1. Forging Synthetic Assets

The synthetic assets issued by the entire system are all produced by users staking certain collateral. The initial collateral includes CRF, DOT, KSM, BTC and ETH, and the collateral rate depends on the variation of the collateral itself. We plan to refer to the collateral rate of other projects at the early stage of the project and set the rate between 150% and 800%. For example, if a user wants to mint synthetic assets worth \$100, he/she needs to put \$150 to \$800 collaterals, depending on which collateral he/she uses. The user's collateralization ratio should be as high as possible than this prescribed ratio, that is, when the price of the collateral drops, the collateralization ratio may be insufficient. At this time, the user should replenish the collateral or return (destroy) a part of synthetic assets. The system stipulates that only users who are greater than or equal to the specified collateralization ratio will receive system rewards as an incentive. In the future, the collateral and collateral rate can be adjusted through community governance. When users stake collaterals and forge synthetic assets, corresponding debts are generated. When the user wants to unlock the collateral, he must repay the debt, that is, destroy the previously generated synthetic assets.

In order to encourage users to use CFR as collateral, users who stake CRF will earn a larger proportion of the system rewards. This will be explained in detail in the token economics section.

Assets synthesized by direct staking of collateral in the entire system can be fitted in to four different categories: stablecoins (RaftStable), simple synthetic assets (Raft), synthetic bonds (BondRaft) and smart synthetic assets (UnivRaft).

- Stablecoins (RaftStable)

Stablecoins are a very important part of synthetic assets, such as rUSD and rEuro which can be used as denomination currency in the whole system as well as contract trading. Furthermore, stablecoins can also be used as collateral lending. Users can borrow stablecoins such as rUSD and exchange it into real world dollars.

- Simple synthetic assets (Raft)

Simple synthetic assets can be cryptocurrencies such as rBTC and rETH, stocks such as rAAPL, gold such as rXAU and any real world assets.

- Synthetic bonds (BondRaft)

Synthetic bonds are synthetic assets paying interest issued by the system.

- Smart synthetic assets (UnivRaft)

Smart synthetic assets means that users can issue any kind of a financial contract through this system. By this way, we can stimulate any financial derivatives and include the whole world's assets.

2.1.2. Sharing Debt Pool

Once a user minted some synthetic assets, the assets can be put into the sharing debt pool (SDP), and the user will be assigned a fixed debt ratio which is the ratio of the value of the user's synthetic assets to the value of all synthetic assets in the entire system. "Fixed" means this ratio will not change due to changes in asset prices, and will be used to calculate the user's profit and loss. This ratio will only change when a new user mints new assets or an existing user destroys existing assets.

Belows are three examples to illustrate how we calculate every user's debt ratio.

Example 1: Assuming that there are only two users in the system, A and B, A and B each generate rUSD worth \$100 after collateralizing a certain amount of CRF, that is, the system generates a total of \$200 rUSD. At this time, the debt ratio of user A is $100/200=50\%$, and the debt ratio of user B is also $100/200=50\%$.

Example 2: Immediately following Example 1, suppose another new user C joins and newly generated rBTC worth \$200. At this time, the total assets of the system are rUSD \$200 and rBTC \$200, which is a total of \$400. Therefore, the debt ratio of users A and B is adjusted to $100/400=25\%$, and the debt ratio of new user C is $200/400=50\%$.

Example 1 illustrates the generation of debt ratio in the initial state of the system, and Example 2 illustrates how new users will affect the re-division of debt ratio. What follows is an example of a more general situation.

Example 3: Assume that the entire system has generated a synthetic asset of \$100K, and now a new user X has joined and generated a synthetic asset of \$100. Then the debt ratio of user X is $100/(100+100000)=0.0999\%$. Suppose that there was an old user A whose debt ratio was 0.2%. After X is added, the debt ratio of user A becomes $0.2\% \times 100000 / (100+100000) = 0.1998\%$. By analogy, we can calculate the change in the debt ratio of all users.

2.1.3. Optional Joining of SDP

Because of the principle of the sdp trading mode, users who generate any synthetic asset and join the debt pool will automatically become a long holder of the asset (the principle will be explained later). That is, even if the user generates a stable currency, it will automatically become a long position in the stablecoin, causing losses when other assets rise. We call this loss "crafting loss". This is like another form of impermanent loss in liquidity mining. To avoid this loss, we innovatively provide users with the option of whether they want to join the debt pool. So a user can choose not to join the debt pool if he/she does not want to take the risk. In this case, users can essentially use this system as a lending platform, and the system will charge interest on the assets users minted. The interest rate will be determined by community governance later.

In order to encourage users to join the debt pool as much as possible, users who join the debt pool will earn a larger proportion of the system rewards. This will be explained in detail in the token economics section.

2.2. Kingsman

2.2.1. Trade in Kingsman

Kingsman is an exchange that provides conversion of different synthetic assets and contract trading, using SDP trading mode. Due to the design characteristics of SDP, this DEX does not require a counterparty, and there is no issue of trading depth.

All synthetic assets can be converted into other synthetic assets in Kingsman, e.g. from cryptocurrencies such as rBTC, rETH, and rDOT, to foreign exchange such as the euro, yen, renminbi, and even gold and various stocks. It supports both long and short. All these assets are systematically synthesized, not real assets, and their conversion rate is determined by the external real price provided by the oracle. This conversion process does not require a counterparty, and users can always convert all their assets supported by the system with unlimited liquidity.

When performing synthetic asset conversion in Kingsman, users need to pay a 0.3% transaction fee, which enters the system fee pool. And all the fees will be converted to CRF using auction or DEX. 40% of the fees will be distributed as rewards to users who meet the specified collateralization ratio in the entire system, and the reward ratio is determined by the debt ratio. Another 40% will be destroyed. The remaining 20% will be reserved for future maintenance and development of the system. For new users, they need to hold debts for more than a certain number of days or cumulatively use them for more than a certain number of days (to be determined) to be eligible for the fee pool rewards.

The prices or conversion exchange rates of all synthetic assets in this system are provided by the oracle machine reading external exchange data, and future planning can introduce decentralized oracles.

2.2.2. How to calculate profit or loss

Bellows are two examples to illustrate how we calculate profit or loss using SDP trading mode.

Example 4: Assuming two users A and B, A generates \$100 rBTC, and B generates \$100 rUSD, the respective debt ratio is 50%, and the total system debt is \$200. Suppose the price of BTC rises by 50%, so the value of rBTC held by A becomes \$150, and the value of rUSD held by B is still \$100. At this time, the total system liability becomes $\$150 + \$100 = \$250$. Note that because the debt ratio has not changed, A's debt is $\$250 * 50\% = \125 , and B's debt is also \$125. Therefore, it can be calculated that the profit or loss of A is $\$150 - \$125 = \$25$, and the profit or loss of B is $\$100 - \$125 = -\$25$. The sum of all users' profit and loss in the entire system is 0,

which is similar to a traditional contract trading system. It should be noted that although B did nothing after generating rUSD, he/she still lost money due to the increase in the price of BTC. This is because rUSD is generated, which by default is equivalent to becoming a long position in the U.S. dollar (in this case, it is also equivalent to a short position in BTC)! We define this loss as "crafting loss".

Example 5: Suppose that following the assumption in example 4, now A holds \$150 rBTC, and B holds \$100 rUSD. Now suppose that there is a new user C, who generates rUSD of \$100, and calculates the new debt ratio. Note that the total debt of A and B is now \$250 instead of \$200 in the initial state! Therefore, after C's operation, the total debt of the system becomes \$350. The ratio of A is $\$125/\$350=35.71\%$, the ratio of B is $\$125/\$350=35.71\%$, and the ratio of C is $\$100/\$350=28.57\%$.

2.2.3. An upgrade for the SDP trading mode

In Crafting Finance, we have upgraded the sharing debt pool model (SDP) proposed by Synthetix. Different from Synthetix, in which users have no choice and can only join the debt pool when forging synthetic assets. We innovatively proposed that users can choose whether to join the debt pool, and found that even if users do not join the debt pool, they can still trade in the system (Kingsman), and bring more possibilities to the entire system. Below we use two simple examples to illustrate.

Example 6: Suppose there are user A and user B. User A chooses not to join the debt pool when forging synthetic assets, and user B chooses to join the debt pool when forging synthetic assets. Suppose that before A and B forged synthetic assets, there were originally \$100 rBTC in the system. Then, A forged \$100 of rUSD but did not join the debt pool, and B forged \$100 of rBTC and joined the debt pool. Then, the assets and liabilities of the entire system become \$200 rBTC in the debt pool, and \$100 rUSD outside the debt pool. B accounts for 50% of the system's liabilities, and A has no debt ratio because he/she has not joined the debt pool.

Now if B buys \$100 rUSD from A, and the \$100 rUSD is not in the system, can it be traded in the system? The answer is yes. For example, B converts this \$100 rUSD to rBTC through our trading system Kingsman, and the assets in the debt pool become a total of \$300 rBTC, -\$100

rUSD, the total assets and liabilities of the system are still \$200, and B's debt ratio is still 50% which is \$100. That is, by allowing the balance of an asset in the debt pool to be negative, we have realized that synthetic assets that are not in the debt pool can also be traded in Kingsman.

Example 7: If there is no user B, can user A who does not join the debt pool directly go to Kingsman to trade? The answer is also yes. Imagine that the debt pool originally had \$100, and it was all rBTC, while A forged \$100 of rUSD but did not join the debt pool. If A converts rUSD to rBTC through Kingsman, the assets in the debt pool will become \$200 rBTC and -\$100 rUSD, and the total assets or liabilities of the debt pool will still be \$100. How to calculate profit and loss? In fact, it can still be calculated according to the debt ratio. For example, if the price of BTC to USD doubles, the assets in the debt pool will become \$400 rBTC and -\$100 rUSD, that is, total assets or liabilities have become \$300, of which \$200 is A's assets. However, because A has not joined the debt pool, A's debt is still 0! So A's profit is the current \$200 minus the initial \$100, and the profit is \$100. Note that after removing A's assets, the assets in the debt pool are still \$200, but the liabilities are \$300, so other people in the debt pool will lose \$100! That is to say, in this example, when A finds that everyone in the debt pool is long in BTC, and BTC price will indeed rise, A can use the external rUSD to exchange rBTC through Kingsman to earn money from those with long positions in the debt pool. Conversely, if BTC price falls, people in the debt pool will make a profit, and A will lose money, that is, people in the debt pool can earn external money. In Synthetix, if the entire system is long in BTC, no one will make a profit and no one will lose no matter how the BTC price changes. Therefore, our design can introduce additional liquidity from the outside, which greatly improves the original design of Synthetix.

3. Other Modules

3.1. Debt Pool

The debt pool is the sum of synthetic assets generated by all users. It records the real-time inventory of all synthetic assets in the system. According to the amounts of synthetic assets generated by each user, the debt pool also records every user's debt ratio. Whenever a new synthetic asset is generated, the debt ratio of the system must be recalculated.

3.2. Fee Pool

Users trading or converting synthetic assets on the DEX will incur transaction fees. The fee ratio is set at 0.3%, and these fees all enter the fee pool. And all the fees will be converted to CRF using auction or DEX. 40% of the fees will be distributed as rewards to users who meet the specified collateralization ratio in the entire system, and the reward ratio is determined by the debt ratio. Another 40% will be destroyed. The remaining 20% will be reserved for future maintenance and development of the system. The system stipulates that only users whose collateral is the CRF and join the SDP can receive rewards, as an incentive for CRF holders. Because the collateral price fluctuates, it is stipulated that only users who meet the collateralization ratio are eligible to receive rewards.

3.3. Interest Pool

Users who choose not to join the SDP will pay interest on their synthetic assets, and the interest will enter the interest pool. 80% of the interest will be converted to CRF and the converted CRF will be destroyed as another way to support the price of the token. The remaining 20% will be reserved for future maintenance and development.

3.4. Oracle

Since the price of contract trading needs to be read from outside sources, the oracle is a very critical part of this project. In the initial stage, the system will use the centralized oracles provided by the project team, and in the future, it will introduce more secure decentralized oracles.

4. Token Distribution and Economics

4.1. Distribution

Crafting Finance Token: CRF

Max Supply: 2,000,000,000

The Crafting Finance(CF) token is CRF, with a hard cap of 2 billion. The token distribution is:
40% for liquidity Incentive;
19% for offering and sale;

1% for initial liquidity;
14% for ecosystem partners;
6% for project marketing;
5% for advisors;
15% for team.

4.2. Economics

CRF is the project token as well as the governance token. So, first of all, all the parameters involved in CF, including the increase or decrease of the types of collateral, the adjustment of the collateralization ratio, the types of synthetic assets, etc., can be determined by voting by CRF holders.

Also, we have three kinds of economic incentives for CRF holders currently.

- 1) All unallocated and future tokens to be issued annually will be used as rewards depending on the types of users. According to whether the user uses CRF as collateral and joins the SDP, there are four types of users in the system.
 - a) Users who use CRF as collateral and join the SDP will earn 60% of these rewards.
 - b) Users who use CRF as collateral but do not join the SDP will earn 20% of these rewards.
 - c) Users who use other tokens as collateral but join the SDP will earn 20% of these rewards.
 - d) Users who use other tokens as collateral and do not join the SDP will earn 0% of these rewards.
- 2) The fees collected from trading in Kingsman will enter the fee pool. And all the fees will be converted to CRF using auction or DEX. 40% of the fees will be distributed as rewards to users who meet the specified collateralization ratio in the entire system, and the reward ratio is determined by the debt ratio. Another 40% will be destroyed. The remaining 20% will be reserved for future maintenance and development of the system. The system stipulates that only users whose collateral is the CRF and join the SDP can receive rewards, as an incentive for CRF holders. Because the collateral price fluctuates,

it is stipulated that only users who meet the collateralization ratio are eligible to receive rewards.

- 3) Users who choose not to join the SDP will pay interest on their synthetic assets, and the interest will enter the interest pool. 80% of the interest will be converted to CRF and the converted CRF will be destroyed as another way to support the price of the token. The remaining 20% will be reserved for future maintenance and development.

5. Roadmap of Development

5.1. 2021 Q2

- 1) Realize the functions of staking DOT and CRF, forging synthetic assets, including rUSD, rBTC, rETH, rAAPL, rXAU, etc.
- 2) Realize the debt pool function: When a user newly generates or destroys rUSD, the debt ratio is re-determined, and the user's profit is calculated based on the change in asset prices.

5.2. 2021 Q3

- 1) Realization of Kingsman version 1.0.
- 2) Realize the function of fee pool: transaction fees are included in the fee pool to complete the benefit distribution of CRF users.
- 3) Realize the trading function on the Web end, allowing users to freely trade various synthetic assets. It is convenient for users to stake CRF or DOT to mint rUSD and destroy rUSD. Allow users to view the debt ratio, total system debt, balance of personal synthetic assets, rewards income, etc.

5.3. 2021 Q4

- 1) RaftBond will be online for issuance and trading.
- 2) UnivRaft will be online for universal synthetic assets, user could use it to issuance smart assets.
- 3) Will launch the brand-new oracle system which could feed every asset's price all over the world.