Solera Vision

Introduction

"Stablecoins" is a term that refers to crypto assets, coins, and tokens that are pegged to the value of a specific real-world currency or asset, usually the US dollar or another fiat currency. Over the years, stablecoins have become a cornerstone of the DeFi ecosystem with a total market capitalization of over $100 billion. Stablecoins have also become an essential part of many DeFi trading strategies and are used in most modern DeFi protocols. They are ubiquitously recognized as the most effective current use for the crypto ecosystem.

Several mechanisms are used to create stablecoins. These include fiat-backed coins (such as Tether USDT or Circle USDC), crypto-backed stablecoins (such as MakerDAO DAI or Liquity LUSD), or purely algorithmic stablecoins (such as NuBits or AMPL).

CDP (collateralized debt position)-based stablecoins maintain the peg to the stable target using one or more stabilization mechanisms that are designed to ensure that the peg remains in case the collateral goes up or down in value. When the price of the collateral drops below a defined threshold, the position is liquidated and the outstanding debt is covered. Liquidations are an essential component of the stabilization mechanism and are common among most CDP-based protocols. Other mechanisms, such as arbitrage, exist to drive the price back down in case the stable coin overshoots the peg.

Minting stablecoins against overcollateralized debt positions is not a new concept for the crypto space. It was popularized by MakerDAO [1] and further developed by several other projects, the most notable of which are Liquity [2], Lybra Finance [3], and Prisma Finance [4]. The key use of these protocols is the ability to mint stable assets pegged to USD using volatile crypto collateral without the need for fiat currencies. These protocols have performed extremely well even under the most challenging market conditions and have thus proven themselves to be reliable and robust stablecoin mechanisms.

Most of these projects operate within the constraints of a single blockchain. This means that both the collateral and the minted stable tokens are assets on the same chain. Solera expands this concept by removing the chain boundaries and allowing users to lock collateral on one chain while emitting and using stablecoins on a completely different chain. This approach offers several key advantages over single chain protocols:

- Providing more sources for collateral liquidity and lowering costs associated with obtaining collateral for stablecoin loans
- Simplifying the process of moving stablecoins across networks and expanding associated DeFi trading opportunities
- Avoiding extra costs and security risks associated with bridging
- Allowing more efficient collateral balancing and management

The cross chain operations are orchestrated via Solera AVS, an autonomous validated service running on EigenLayer infrastructure. Using EigenLayer allows the utilization of staked ETH from the Ethereum consensus layer to achieve a high level of security for the service and reduce the risks for managing the state of the protocol across multiple blockchains.

In this document we will present the structure and operation of the Solera protocol (Section 2), the process of cellar liquidations (Section 3), the cross chain orchestration (Section 4), and the governance (Section 5).

Solera Protocol

2.1 Borrower Operations

2.1.1 Creating Cellars

Any Solera protocol user can create a **cellar** (a CDP within Solera protocol) by providing any token from the approved collateral list. The user can then borrow nUSD stablecoins against the current US dollar value of the collateral which is calculated from the Oracle data for the base asset market value. The maximum amount of nUSD that can be borrowed is limited by a **minimum collateral ratio** (MCR), which is determined by the governance but is never less than 150%, meaning that up to two-thirds of collateral dollar value can be withdrawn in the form of **nUSD**. To protect the system from a multitude of small cellars with low CR that could affect the effectiveness of the redemption mechanism, the minimum amount of collateral required to create a cellar is $3000 per cellar.

When a user opens a new cellar, a **liquidation reserve** of 200 nUSD is reserved by the protocol as compensation for the gas costs if the cellar needs to be liquidated at some point. This amount is added to the cellar debt, impacting its collateral ratio. When a borrower closes their cellar, the liquidation reserve is refunded, i.e., the corresponding 200 nUSD debt on the cellar is canceled and the borrower needs to pay back 200 nUSD less to fully pay off their debt.

2.1.2 Managing Cellars

After creating a cellar, the user can add or remove collateral by directly modifying the cellar balance. The balance can not be reduced to exceed the minimum limit causing a cellar to be undercollateralized. Obviously, reducing the collateral of the cellar increases the chance of cellar liquidation in case the price of the underlying asset causes the position to go under the limit

2.1.3 Closing Cellars

A cellar can be closed after the entire debt is repaid, minus the liquidation reserves. The collateral is then returned to the owner of the cellar.

2.1.4 Borrowing Fees

The protocol charges two types of fees: a **one-time** borrowing fee for the borrowed stablecoins and **time-based fees** for holding a loan. The fee is added to the cellar debt and is given by a **base rate** + 0.5% (see 2.3 Redemptions) multiplied by the amount of nUSD minted by the borrower. The minimum borrowing fee is 0.5% and the maximum is 5%. Time-based base rate is set to 0% at protocol launch but can be enabled and adjusted by Solera DAO based on market conditions. It will be an important mechanism for dynamic management of market risk factors.

2.2 Stability Pool Operations

The stability pool is used for liquidations of insufficiently collateralized positions and is composed of nUSD tokens deposited by the users. The incentive to participate in the stability pool is the ability to buy out liquidated position collateral at a discount. Additionally, Solera governance tokens (SLRA) are allocated to those who participate in the stability pool. Participants in the stability pool are incentivized to lock their deposits through SLRA liquidity mining rewards and additional liquidation discounts as a function of the nUSD lock period.

Operations on the stability pool include opening positions in the stability pool, managing positions, closing positions, and claiming rewards. Operations can be performed on any chain and the stability pool can be rebalanced by the Solera AVS by burning and minting coins on different chains.

2.3 Redemptions

The primary stabilization mechanism used in Solera is the ability to directly redeem nUSD tokens for the underlying collateral based on the face value of the redeemed tokens as provided by an external Oracle. This enables direct arbitrage whenever the nUSD market price deviates from $1, and as a result, stabilizes the price of the pegged asset. Since the collateral of the cellars can vary, the redeeming user can receive various collateral types out of the list of allowed tokens.

Though the Solera protocol allows redemptions from any cellar, the redemption fee structure incentivizes redemptions from positions with lower possible cellar collateralization ratio (CCR). This guarantees that the total collateral ratio is as strong as possible. Therefore, the **redemption fee** is defined as a function of the current base rate and the redeemed nUSD amount as a proportion of the entire nUSD supply as well as the CCRof the position, one or multiple, from which the collateral is redeemed. The higher the CCR of the redeemed position, the higher the redemption fee. The goal of making the fee proportional to the CR of the position is to incentivize redemption from the weaker (in terms of CCR) positions and thus improve the overall health of the Solera protocol. Redemption fee is a function of the current base rate and the redeemed nUSD amount as a proportion of the entire stablecoin supply. The base rate is initialized to 0% at launch.

After each redemption, the base rate is increased by the proportion of redeemed nUSD and then applied to the current redemption as follows:

$$b(t) := b(t-1) + \alpha \times mn$$

where $b(t)$ is the base rate at time t, m the amount of redeemed nUSD, n the current supply of nUSD and α a constant parameter set to 0.5. The base rate decays over time due to a decay factor that is applied with every redemption and issuance of nUSD prior to calculating the resulting fee. The decay is of the form: $b(t) := b(t-1) \times \delta \triangle t$ where δ is a decay factor (e.g. 0.94) and $\triangle t$ the time elapsed since the last redemption or loan issuance. The decay factor δ is chosen such that the half-life of the base rate is 12 hours.The minimum fee is 0.5%. The fee is subtracted from the redeemed stable coins, reducing the ETH that the redeemer receives in return.

The collected redemption fee is split between the Solera protocol and the cellar owner to compensate the latter. The rate of the distribution is decided upon and can be changed by Solera DAO.

3. Cellar Liquidation

3.1 Liquidation Through Stability Pool

As previously discussed, the main purpose of the stability pool is to act as a first line of defense and use the nUSD deposited by pool participants to liquidate risky cellars. If, and only if, the cellar collateralization ratio drops below the MCR, liquidation can be triggered by any user and nUSD from the stability pool is used to offset the outstanding debt. These nUSD are burned and, in return, 99.5% of the cellar collateral is moved to the stability pool, while 0.5% is awarded to the liquidator. The protocol will not allow the liquidation of “healthy” cellars that are sufficiently collateralized.

Since liquidation initiation and the liquidation itself are two separate processes, the liquidation can be triggered by any blockchain user without the need to provide any liquidity. The liquidation then happens through the stability pool. Users are incentivized to trigger the liquidation as soon as possible and are compensated by liquidation reserve, an amount that was withheld by the protocol during cellar creation, in addition to 0.5% of collateral.

3.2 Debt Socialization

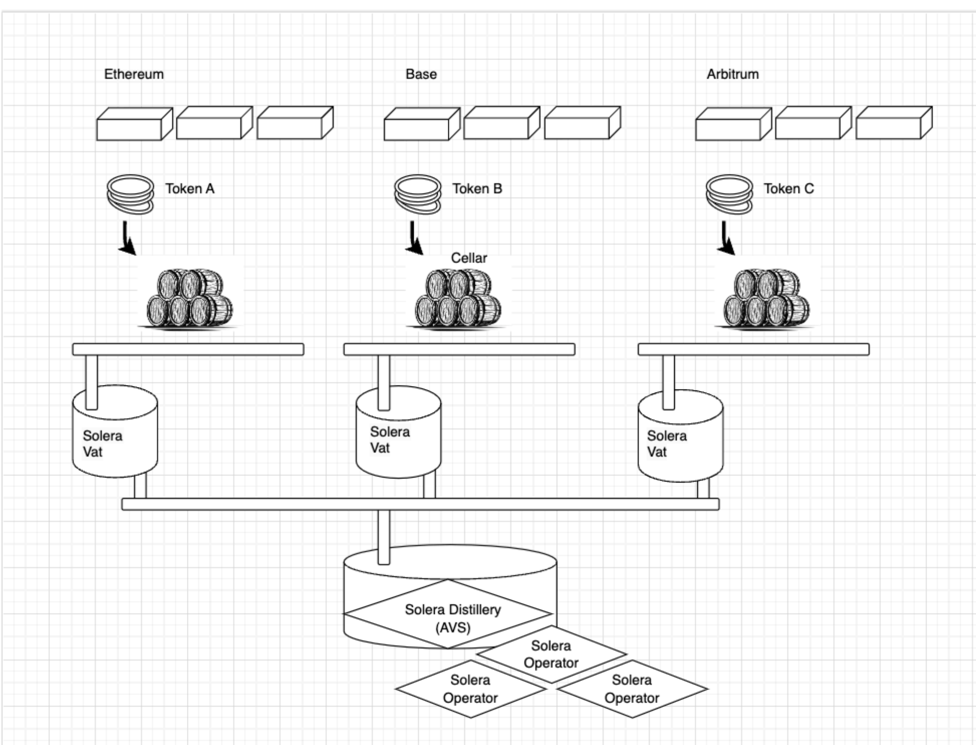
Debt socialization is a liquidation process that redistributes the remaining debt and collateral of all cellars that fall under the CR threshold amongst all healthy cellars. While this increases the debt of all users, it also adds collateral that covers the debt as it adds the liquidation bonus, which eventually makes all remaining cellars stronger. Debt socialization is transparently managed by Solera AVS across multiple chains within the same collateral asset class.

Despite its complexity, debt socialization is an important mechanism designed to make the system self-sufficient as a liquidator of last resort. This approach is more equitable than mechanics utilized by other stablecoin and lending protocols, which may lead to unequal consequences for users and provoke bank runs. By distributing the bad debt proportionally, Solera prevents disproportionate losses. Nevertheless, the likelihood of such an event is very low and would signify a breakdown in the protocol, so the system is designed to avoid it by all means.

4 Cross Chain Orchestration

Solera cross chain orchestration is performed via the actively validated service (AVS) running on top of the EigenLayer and implementing the distributed validation semantics. Solera AVS performs the essential tasks of monitoring the value of the collateral locked on the supported blockchains and the amounts of nUSD stablecoins minted against the locked collateral. It coordinates the minting, redemption and liquidation of Solera positions. Solera AVS is also responsible for storing the state of cross chain operations via on chain contracts, as well as the data availability layers.

It is important to note that Solera is agnostic to the underlying smart contract technology and can thus be used with either EVM compatible or other chains that have smart contract capabilities.



Key operations of the Solera AVS include

- Monitoring state of collateral vaults (cellars) across all chains
- Relaying user actions between networks
- Minting and burning the stablecoins according to the issuance rules
- Handling oracle price updates and managing liquidations

The Solera AVS can automatically balance the stability pools across networks to handle cross chain liquidations. All operation related data is stored on a data availability layer (such as EigenLayer DA) and can thus be kept and audited upon request.

Validators are rewarded with allocation of the SLRA governance token as well as a portion of protocol fees according to governance rules

5. Governance

Solera governance will be performed by Solera DAO through staking the SLRA governance token and will include the decisions outlined below.

5.1 Risk Management

Upon launch, Solera will allow the use of a closed list of tokens as collateral. Solera DAO will vote on the addition of the new collateral types that can be used to borrow nUSD tokens. Each new collateral should adhere to the basic criteria for Solera collateral types as described below:

1. The availability of markets other than Uniswap pools where the token is traded, thus setting an independent market price for the token pair.
2. A reliable Oracle providing the current price of the underlying assets in the Uni V3 position in USD.
3. A sufficient amount of trading volume and low-volume volatility in the Uniswap pool to maintain a consistent current price of one asset relative to the other.

The DAO can also determine a debt ceiling for each collateral type.

The DAO can determine the minimal collateralization ratio (MCR) for a cellar. In future versions of the protocol, the MCR may differ according to the collateral type.

5.2 Fees Structure

The DAO will be responsible for determining the one-time fees for the Solera protocol, including the minting and redemption fees. It is also responsible for enabling and setting the time-based borrowing fees (**interest rate**) based on the protocol risk parameters and market conditions.

5.3 Major Upgrades

Whenever there are breaking changes and upgrades to the protocol that fall outside the scope of the above-mentioned changes in protocol parameters, a DAO vote and decision will be required. Usually, the discussion on these changes will start before the official vote is conducted to gain preliminary approval on the direction and scope of the changes. Once such approval is gained the official vote and the subsequent execution of the proposal will be handled.

5.4 Treasury Management

The DAO can vote on and initiate incentive programs by distributing portions of the SLRA tokens available for this purpose. Incentive programs aim to improve adoption as well as attract liquidity and foster collaborations that will benefit the Solera protocol.

5.5 Oracles

The DAO is responsible for selecting and assigning Oracles that will be used for providing the US dollar value of the allowed assets.

Conclusion

The Solera protocol allows the use of volatile assets across multiple blockchains as collateral for minting a stable asset, and thus additional trading strategies for holders of such positions. Solera builds on the concept of collateralized debt positions (CDPs), which has proved itself as a reliable and stable solution for building stable assets backed by volatile crypto collateral. The stabilization mechanism is implemented through direct redemptions and backed by several liquidation stages for risky positions.

Solera builds upon EigenLayer AVS to provide reliable decentralized collateral management across networks while improving the capital efficiency, reducing bridging costs and increasing reliability of stable coin loans.

References

[1] Maker DAO Whitepaper (link)

[2] Liquity Whitepaper (link)

[3] Lybra Finance (link)

[4] Prisma Finance (link)

[5] EigenLayer Whitepaper (link)