

The Clever Protocol Technical Report

January 2020

Summary

This document will go over the entirety of the on-chain protocol for the CLEVER (CLVA) token. Phase 1 will be the 'Timed Swap' Phase where ETH will be exchanged for tokens at a set variable rate. Phase 2 will begin when the Swap phase ends (after 30 days). During this phase, all holders of CLVA, will receive a cycle award based on the % of CVLA they own, and second a cycle Bonus Percentage based on their current token holdings after the cycle award.

Phase 0: Deployment

Please Refer to the Figure One

Deployment follows 5 steps.

One: Deploy the *CleverToken* contract.

Two: Deploy the *CleverProtocol* contract, intrinsically setting the admin address and token address via constructor arguments.

Three: Deploy the *TimedSwap* contract, intrinsically setting the token address, protocol address, and start time (Feb 1 2021 UTC 00:00) via constructor arguments.

Four: Link the Token with the Protocol and TimedSwap contracts with the functions `setProtocol` and `addMinter`, respectively. The token needs to know *who* the protocol is; distribution will only be allowed to be called by this address. Additionally, the TimedSwap contract needs to have the *minter* role in order to mint tokens for buyers during the 30 day timed-swap phase.

Five: Link the Protocol with the TimedSwap via the `setTimedSwap` function. The Protocol must know the status of the TimedSwap contract in order to properly calculate cycles, therefore they are linked.

This inheritance model ($\text{TimedSwap} \rightarrow \text{Protocol} \rightarrow \text{Token}$) allows for the fully decentralized actions: TimedSwap (once finished) 'turns-on' the protocol's distribution and the protocol (once 'turned-on') will control the token distribution.

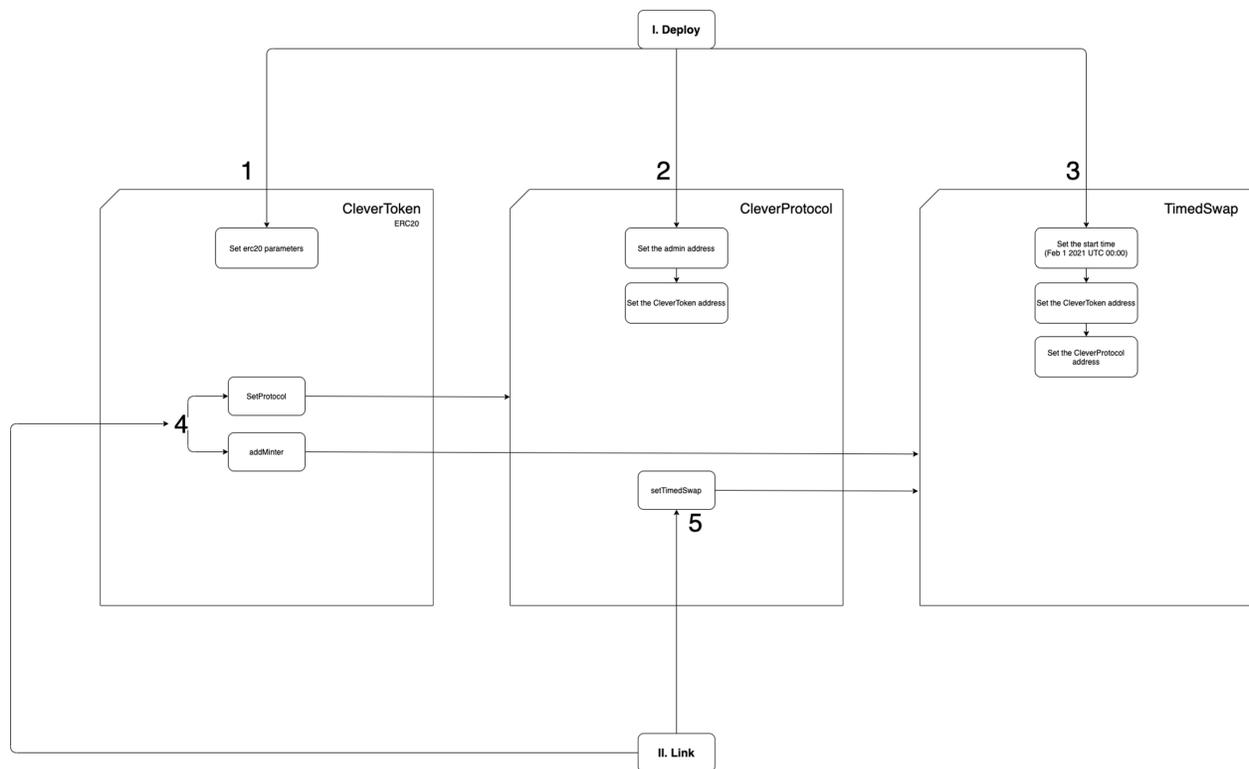


Figure 1: Phase 0: Deployment

Phase 1: Timed Swap Phase

Please Refer to the Figure Two

The Timed Swap Phase will last for 30 days total and will allow users to buy CLVA tokens with ETH at a variable rate depending upon the day (refer below) using portal.clva.com.

The TimedSwap contract will not allow tokens to be purchased sooner than Feb 1 2021, simply reverting when called. Upon Feb 1 2021 at UTC 00:00, the TimedSwap will go 'live'. Phase 1 begins.

(CLVA : ETH)

Day 1 = 500 : 1

Day 2-3 = 476 : 1

Day 4-7 = 455 : 1

Day 8-10 = 435 : 1

Day 11-30 = 417 : 1

Once live, `buyTokens()` will be callable on the TimedSwap contract. This function first check that the time is correct, check the address and valid amount of ETH to convert. The contract then. calculates the internally set conversion rate for the corresponding day and in the same transaction, forwards the ETH to the protocol contract to be locked, and mints new tokens and immediately transfers them to purchasers.

The ETH forwarded to the protocol will be immediately locked, and only unlocked once incrementing cycles have been completed at the following rate:

Cycle 1 = 45% locked ETH released

Cycle 2 = 40% remaining ETH released

Cycle 3 = 35% remaining ETH released

Cycle 4 = 30% remaining ETH released

Cycle 5 = 20% remaining ETH released

Cycle 6 = 10% remaining ETH released

Cycle 7 = 5% remaining ETH released

Cycle 8+ = 4% remaining ETH released

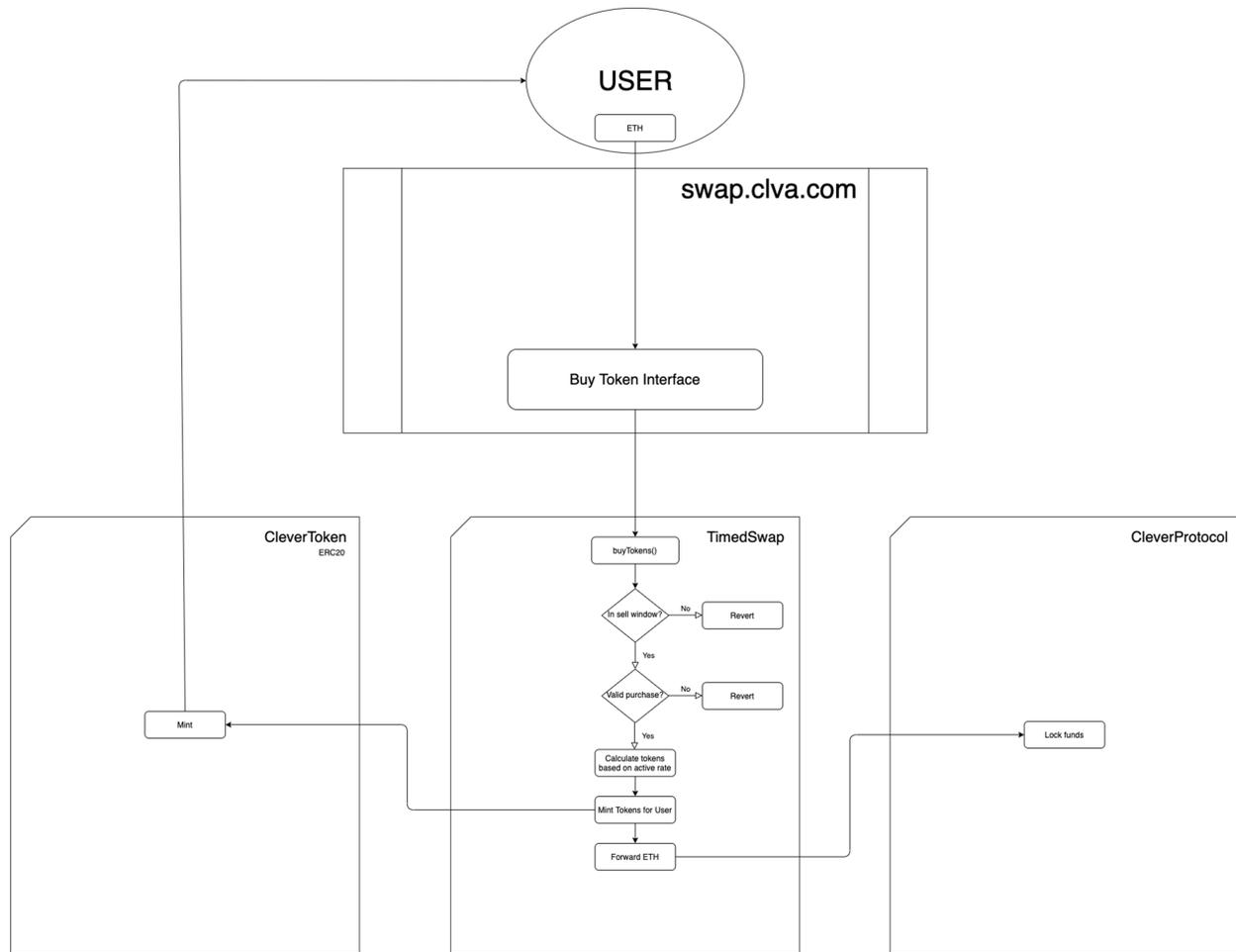


Figure 2: Phase 1: Timed Swap Phase

Phase 2: Cyclical Distribution

Please Refer to the Figure Three

Cyclical distribution will begin 14 days after the completion of the swap phase (44 days total from Feb 1). **Note:** Exact interest gain rates and bonuses can be found on a per cycle basis in the whitepaper.

Once per cycle (14 days), `distributeCycleAward()` of the *CleverProtocol* contract will be publicly callable. Once called a single time for a given cycle period, this functionality will be locked until the next fortnight completes allowing for the following cycles to be distributed every 14 days. This continues cyclically for 888 cycles (≈ 34 years).

Once checking that the current cycle is valid and ready to be paid out, bonus and awards are gathered and sent directly to the *CleverToken* contract. This automatically distributes interest gains to all holders of CLVA through an internal conversion rate change (more on this in the next section). Once all holders of CLVA have received their interest payout, ETH that was locked in the *CleverProtocol* will be released according to the payout percentage for that cycle.

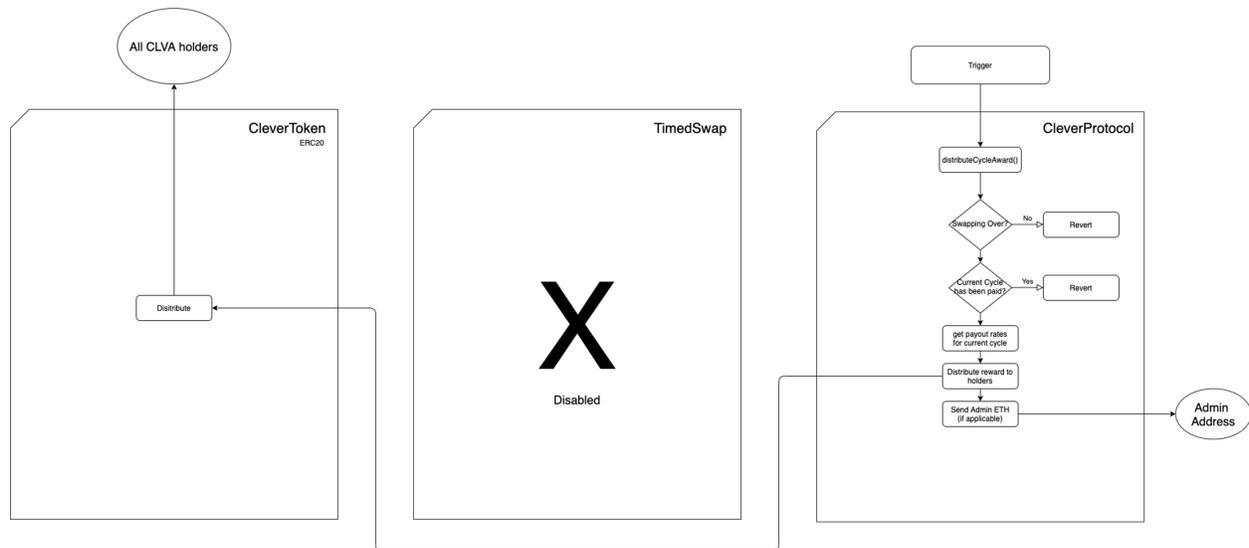


Figure 3: Phase 2: Cyclical Distribution

fragsPerToken: Clever's Internal Interest Yield Mechanism

In order to distribute interest in a gas-less way to holders, CLVA makes use of an internal denomination: *frags*. The amount of *frags* that a holder has is static during interest grow, while the conversion rate, fragsPerToken, changes in order to globally expand balances with the use of a single variable.

A simple example:

If fragsPerToken = 200, then 200 frags = 1 token.

User A holds 100 frags

User B holds 1200 frags

User C holds 750 frags

User A would then have a token balance of: $\frac{100}{\text{fragsPerToken}=200} = 0.5$ Tokens

User B would then have a token balance of: $\frac{1200}{\text{fragsPerToken}=200} = 6$ Tokens

User C would then have a token balance of: $\frac{750}{\text{fragsPerToken}=200} = 3.75$ Tokens

Now let's say User's have not bought/sold any tokens, their frag balances would stay the same. Changing the internal mechanism for conversion would not allow for a globally distributed expansion of every one's accounts according to the conversion rate. Setting the new fragsPerToken = 175, will yield an interest gain of 30.5 %:

User A would then have a token balance of: $\frac{100}{\text{fragsPerToken}=175} = 0.571$ Tokens

User B would then have a token balance of: $\frac{1200}{\text{fragsPerToken}=175} = 6.857$ Tokens

User C would then have a token balance of: $\frac{750}{\text{fragsPerToken}=175} = 4.286$ Tokens