# Zethyr

A viable choice in financial system

## Abstract

Any blockchain is fundamentally a ledger of financial transactions with a currency at its core. However, a currency without the backing of a sound and robust financial ecosystem is like the USD without its supporting banks and financial services – its use cases will be too limited that mass adoption is practically impossible. In this light, Zethyr is the missing piece to TRON – a financial ecosystem enabling TRON users.

## Manifesto

Zethyr envisions to give the masses a viable choice in financial system.

Why does a viable choice in financial system matter?

Financial system dates back as far as human history goes - from the barter system (9000 BC), seashells (1300BC), precious metal system (1100BC), paper money (118BC), the Gold Standard (1800AD) to the current fiat system. At every step of human progress, progress in the financial system has always been the forerunner and enabler. Currently, when one is born, one is largely restricted to the local financial system. If one is born in Venezuela, one is practically restricted to the Venezuelan Bolívar and was subjected to 10,000,000 percent of inflation in 2019. Even in America, one may resent the current financial system when the 99 percent seems to be paying the price for the mistakes of a tiny minority within the upper class. Obviously, the fact that the FED is pumping trillion of dollars into the economy does not help such resentment. Near-zero interest rates across the world may seem ideal for borrowing, but in fact reflect a bigger problem that is a lack of good uses for money, low economic growth and pessimistic economic outlook. In view of such problems, the need for freedom in financial system arises – one must have the choice of which financial system one wants to be in. While this idea is not new, a choice is not really a choice if it is not viable, because of accessibility or profitability. Currently, only the top few can easily move their money across legislations to aggrandise even more wealth, while the ones who need this freedom the most virtually cannot do so. Cryptocurrencies pave the first step to a choice in financial system for the masses. Now, the masses can choose to keep their money in their domestic currencies or in cryptocurrencies. However, without the backing of a sound and robust financial system, cryptocurrencies will remain largely a store of value with limited use cases and will never be a viable choice to fiats for the masses.

Zethyr is set to change that.

# I.   Zethyr Exchange

Zethyr Exchange is a TRON decentralised exchange, aggregating liquidity from both centralised and other decentralised exchanges across the market for the best price and liquidity in aggregate.

**Aggregate Liquidity**

To increase liquidity, Zethyr Exchange is connected to Binance and other exchanges (including both decentralised and centralised exchanges) via APIs. Therefore, sell orders from Zethyr Exchange can be matched with buy orders from other exchanges and vice versa.

**Protocol Fee**

Zethyr Exchange charges 0.1% fee for both buy and sell orders.

# II.   Zethyr Finance

Zethyr Finance is a TRON decentralised finance protocol, aggregating yields from both centralised and other decentralised protocols across the market for the best yields in aggregate.

**Lending Supply Pools**

At the beginning, Zethyr Finance will open borrowing and lending to: TRX, USDT, WIN and BTT.

For lenders, they can deposit by transferring their assets from their TRON wallets to Zethyr's smart contracts. Likewise, borrowers can borrow from Zethyr's smart contracts directly.

**Collateral**

At the beginning, Zethyr will accept the following as collateral: USDT, TRX, WIN, BTT. After depositing an asset to Zethyr for lending, to enable an asset as collateral, lenders can toggle the collateral switch next to the asset view.

| Tokens | Accepted as collateral | Available for borrowing | zTokens |
|--------|------------------------|-------------------------|---------|
| USDT | Yes | Yes | zUSDT |
| TRX | Yes | Yes | zTRX |
| WIN | Yes | Yes | zWIN |
| BTT | Yes | Yes | zBTT |

**zTokens**

zTokens are pegged 1:1 to the value of the underlying tokens that are deposited in Zethyr. zTokens can be freely stored, traded and transferred. zTokens are minted upon deposits and burned when redeemed. Whenever users' underlying tokens accrue interests in Zethyr protocol, the equivalent amounts in zTokens will be minted and sent to users' wallets directly.

With zTokens, users can enjoy the full benefits of the underlying tokens without ever withdrawing the tokens from Zethyr protocol.

| Deposit tokens | Minted tokens | Users receive zTokens |
|----------------|---------------|------------------------|
| USDT | zUSDT | Upon depositing at Zethyr USDT lending pool |
| TRX | zTRX | Upon depositing at Zethyr TRX lending pool |
| WIN | zWIN | Upon depositing at Zethyr WIN lending pool |
| BTT | zBTT | Upon depositing at Zethyr BTT lending pool |

**Collateralisation Ratio**
Collateralisation ratio is the ratio of the collateral value (in USDT) to the loan and interest value (in USDT).

$$Collateralisation\ ratio = \frac{Collateral\ value\ in\ USDT}{Loan + interest\ value\ in\ USDT}$$

**Liquidation Ratio**
Liquidation ratio is the minimum collateralisation ratio of a respective digital token that Zethyr will accept to protect the protocol's principal.

**Maximum Credit Line**
The maximum credit line from a digital token is calculated as

$$Maximum\ credit\ line\ per\ digital\ token = \frac{Deposited\ digital\ token}{Liquidation\ ratio\ of\ that\ digital\ token}$$

Therefore, the total credit line of a user is simply

$$Total\ credit\ line = \frac{Deposited\ digital\ token\ A}{Liquidation\ ratio_A} + \frac{Deposited\ digital\ token\ B}{Liquidation\ ratio_B} + \cdots$$

Liquidation ratios of different tokens may differ because of the digital token's quality based on Zethyr team's analysis. Liquidation ratio of a digital token may change due to market condition. 200% is the minimum liquidation ratio for any digital token.

**Liquidation**
Liquidation helps protect lenders' principal.

Liquidation occurs when a borrower's total borrowing exceeds his total credit line mainly due to either price fluctuation or interest accumulation. During the liquidation process, his deposited collateral will be liquidated on Zethyr Exchange to refill the lending pools which the borrower defaults. The leftover balance is returned to the borrower's Zethyr account.

In the case of multiple deposited tokens, Zethyr will liquidate the tokens with the lowest total USDT value first because this digital token is probably of least importance to the borrower. If the recovered amount from the liquidated digital token still cannot cover the borrowed amount, Zethyr will proceed to liquidate tokens with the second lowest total USDT value and so on.

In the case of multiple loan tokens, Zethyr will recover the tokens with the highest total USDT value first and so on.

For example, John deposited 80,000 USDT worth of WIN and 20,000 USDT worth of BTT. Then, John borrowed 30,000 USDT and 20,000 USDT worth of TRX. If USDT/WIN and USDT/BTT drop such that John's total collateral is only worth 70,000 USDT and thus his total credit line drops to 35,000 USDT (assuming the average liquidation ratio is 200%), Zethyr will liquidate John's deposited BTT first to recover the USDT loan and then the TRX loan. If the BTT collateral is not enough to recover the loans, Zethyr will continue to liquidate the collateralised WIN. Any leftover amount will be returned to John's account in Zethyr.

**Utilisation of Idle Deposited Tokens**
Unborrowed assets in Zethyr lending pools are considered idle.

To maximise return for lenders, Zethyr will auto deposit idle digital token to other protocols to earn interest. For example, Zethyr will stake idle TRX at a TRON super representative with the highest reward distribution rate.

**Liquidity for Flash Loans and Withdrawals**

While depositing idle tokens to other protocols helps to increase return to lenders, it may reduce the available liquidity for Zethyr borrowers that require instant credit line and for Zethyr lenders that require instant withdrawals. However, leaving too much idle decreases lenders' returns. A trade-off must therefore be made.

At the beginning, Zethyr will leave 5% of the total supply idle at all time to facilitate flash loans and withdrawals. The percentage may change when appropriate.

**Interest rate model**

$$Utilisation\ rate = \frac{total\ demand}{total\ supply}$$

$$Borrowing\ interest\ rate = rf + 2 * Utilisation\ rate * rf$$

Or simply,

$$Borrowing\ interest\ rate = rf(1 + 2 * Utilisation\ rate)$$

In which,

Rf – risk free rate: the rate at which Zethyr manages to get from other quasi-risk-free protocols.

Lender return

The return to lenders of a respective digital token on Zethyr protocol is determined as

$$Return = 0 * \frac{idle\ tokens}{total\ supply} + rf * \frac{staked\ token}{total\ supply} + borrowing\ interest\ rate * \frac{total\ demand}{total\ supply}$$

**Interest Payment**

For borrowers, interests will accrue and compound daily in the same tokens that they borrow. For example, interest of TRX borrowing will accrue in TRX and must be paid in TRX. While borrowers can pay their interest anytime, paying interest daily will prevent daily compounding.

Once Zethyr receives the interest payments from borrowers or other protocols, it will automatically mint an equivalent amount of zTokens and distribute this amount to lenders. Therefore, only interests received, not accrued, from borrowers and other protocols will be paid out daily, in zTokens to lenders. Lenders can redeem the corresponding underlying tokens by burning their zTokens at Zethyr Finance. The daily amounts may vary due to mainly:

- Changing total borrowing amount
- Changing interest rates
- Unpaid interests from borrowers
- Protocol fee

**Rebalance**
Zethyr will rebalance once a day to ensure

- Liquidity for flash loans and withdrawals
- Best yields
- Diversification of risk
- Other factors

**Liquidity**
Since most of the deposit at Zethyr Finance is utilised to maximise yields for lenders, liquidity for flash loans and withdrawals is not guaranteed. Therefore, occasionally, borrowers may not be able to borrow instantly, and lenders may not be able to withdraw instantly. In these rare scenarios, borrowers and lenders may wish to come back 24 hours after, by when Zethyr asset pools have been rebalanced.

At the same time, the floating interest rate is meant to encourage liquidity: when demand/supply ratio is low, the interest rate is low to encourage borrowing, and when the demand/supply ratio is high, the interest rate is high to encourage borrowers to return their loans and to encourage more lenders to supply their idle TRON tokens.

**Max Leverage for Each Collateral Digital token**
To ensure the safety of the depositors' principal, Zethyr needs to ensure that there is enough liquidity in the market in the event of liquidation. Therefore, there is a cap on how much borrowing a collateral pool can get. The cap varies according to changing market liquidity and conditions.

If a user has multiple deposited tokens, his leverage is calculated from the deposit with lowest total USDT value first.

**Interest Distribution**
Each asset will have its own independent smart contract to store its interest. Whenever Zethyr receives interest payment, from both borrowers and other protocols, that interest is deposited to the respective smart contract. Every day, at 0000 Eastern Time, Zethyr will distribute the daily interest to lenders. The amount of interest that a lender receives is proportional to the number of his corresponding zTokens right at that moment, according to the below formula:

$$\frac{Interst_t}{Total\ interst\ in\ the\ smart\ contract_t} = \frac{Number\ of\ respective\ zTokens_t}{Total\ respective\ zTokens\ in\ the\ network_t}$$

in which, t denotes the time of the distribution.

Lenders can then burn zTokens at Zethyr to redeem the underlying assets.

The amount received daily by lenders may vary from the theoretical amount mainly because:

- Some borrowers do not repay interest daily thus the amount available for distribution varies
- Protocol fee

For WIN and BTT lending pools, lenders may receive interest in both TRX (from staking) and WIN/BTT (from borrowers).

**Dapps Staking Rewards**
Each asset will have its own independent smart contract to store its interest. Whenever a dapp distribute its staking rewards, that interest is deposited to the respective smart contract. Every day, at 0000 Eastern Time, Zethyr will distribute the staking rewards to stakers at Zethyr. The amount of staking rewards that a lender receives is proportional to the number of his corresponding zTokens right at that moment, according to the below formula:

$$\frac{Staking\ reward_t}{Total\ reward\ in\ the\ smart\ contract_t} = \frac{Number\ of\ respective\ zTokens_t}{Total\ respective\ zTokens\ in\ the\ network_t}$$

in which, t denotes the time of the distribution

Staking reward is not affected by protocol fee.

**Protocol Fee**
Zethyr Finance charges 5% protocol fee.

The 5% fee is deducted straight from every time a borrower pays his interest or a lender withdraws his interest.

**Mining ZTR**
The protocol fee will mine ZTR.

| Difficulty level | Number of ZTR | Protocol fee/ZTR |
|---|---|---|
| 1 | The first 1 million ZTR | 7.3 |
| 2 | The next 990,000 ZTR | 7.374 |
| 3 | The next 980,100 ZTR | 7.448 |
| 4 | The next 970,299 ZTR | 7.523 |
| 5 | The next 960,596 ZTR | 7.599 |
| 6 | The next 950,990 ZTR | 7.676 |
| 7 | The next 941,480 ZTR | 7.754 |
| 8 | The next 932,065 ZTR | 7.832 |
| 9 | The next 922,744 ZTR | 7.911 |
| 10 | The next 913,517 ZTR | 7.991 |
| … | | |

# III.   Zethyr Governance
Zethyr (ZTR) is a TRC-20 token. After the launch of Zethyr Finance 2, to give back the protocol control to the community, ZTR use cases are reset to zero and restart from Zethyr Governance. ZTR holders and their delegates debate, propose and vote on all changes to the protocol.

# IV. In Development

**Active Pools**

At the beginning, Zethyr Finance 2 mainly uses passive strategies with minimal risks to protect the lenders' principals. Therefore, the returns of these passive pools tend to be limited.

With the development of more financial protocols, both centralised and decentralised, there is an increasing number of active, medium-risks strategies that potentially generate higher returns for lenders. These active strategies may not be accessible to individuals because

    a) individuals do not know about these strategies or
    b) the exorbitant execution fees make those strategies too prohibitive for small amounts.

Zethyr will solve these issues.

# V. FAQs

*General*

Q: What is APR?
A: APR stands for annual percentage rate, the annual interest rate of your borrowing. Daily interest is equal to APR divided by 365.

Q: What is collateralisation ratio?
A: Collateralisation ratio is the ratio of the collateral value (in USDT) to the loan and interest value (in USDT).

$$Collateralisation\ ratio = \frac{Collateral\ value\ in\ USDT}{Loan + interest\ value\ in\ USDT}$$

Q: What is the liquidation ratio?
A: Liquidation ratio is the minimum collateralisation ratio of a respective digital token that Zethyr will accept to protect the protocol's principal.

Q: What are the minimum and maximum borrowing periods?
A: None, as long as your total loan and interest value in USDT is less than your total credit line.

Q: How often is interest accrued?
A: Every 24 hours from the time you borrow.

Q: Do I need to pay my interest regularly?
A: Yes, your best interest is to settle your interest daily. To minimise the chance that borrowers forget that they are borrowing from Zethyr and reduce default risk, Zethyr requires borrowers to settle their interest daily. If unpaid, the interest will be added to the loan principal and therefore the new interest will be accrued from the new loan principal. Once the interest is added to the loan principal, the interest is reset to zero.

Q: After borrowing, can I borrow more from Zethyr?
A: Yes, you can, as long as your total loan value is less than your total credit line.

Q: Can I add more collateral while borrowing?

A: Yes, you can. Adding more collateral increases your total credit line and avoid liquidation.

Q: Can I repay part of the loan principal while borrowing?
A: Yes, you can. Repaying part of the principal lowers your total loan value and avoid liquidation.

Q: I deposited 10 million USDT but I can only withdraw 5 million USDT now.
A: Since funds at Zethyr are automatically allocated to other protocols and borrowers to maximise yield, at every rebalance, only 5% of the total fund is set aside for flash loans and withdrawals. You can wait till the next rebalance, which happens every 24 hours, for more liquidity.

Q: There are 100 million USDT but only 5 million is available for borrowing now?

A: Since funds at Zethyr are automatically allocated to other protocols and borrowers to maximise yield, at every rebalance, only 5% of the total fund is set aside for flash loans and withdrawals. You can wait till the next rebalance, which happens every 24 hours, for more liquidity.

*For WIN and BTT*

Q: Currently I have WIN and BTT as collaterals, how do I migrate them to WIN and BTT lending pools?
A: Go to WIN/BTT asset page and click "Migrate to Zethyr Finance 2"

Q: If I deposit my WIN/BTT to lending pools, do I still receive my daily dividends from WINK/DLIVE?
A: Assets in the lending pools are automatically allocated to maximise yields. For example, in the case of WIN, if at a given time, 50% are staked at WINK, 45% borrowed and 5% idle, your interest will come from both WINK and borrowers and will be greater than if you stake 100% at WINK.