equality

White paper

v 1.0

Table of Contents

Introduction

Equality is a decentralized, non-custodial, peer-to-contract exchange protocol designed to trade assets that, assuming honest and secure conditions, should trade at approximately the same value. As the number of IRC-2 tokens grows, Equality will serve as an important utility to facilitate the direct exchange of these stable assets.

Equality is an automated market maker (AMM) that utilizes the StableSwap invariant designed by Michael Egorov, which most notably serves as the foundation of the Curve protocol. The StableSwap invariant is optimized to provide the protocol with deep liquidity while significantly reducing price slippage, which incentivizes traders to utilize the protocol and significantly reduces the potential "impermanent loss" suffered by liquidity providers.

In order to incentivize liquidity providers, Equality plans to utilize rehypothecation for liquidity pools by depositing them into interest-earning protocols on the ICON network, where the accrued interest will be passed on to liquidity providers. Additionally, liquidity providers will earn EQU tokens, which provide governance rights and ownership over the platform.

The Equality team believes stablecoins will serve an important role in the ICON ecosystem, especially those that enter our network through hyper-connected blockchains. Accordingly, designing a platform that facilitates a frictionless exchange of these assets in a manner favorable to both traders and liquidity providers will serve as yet another critical step toward fulfilling ICON's original goal of interoperability.

Furthermore, we believe Equality can serve as a mechanism for diversification among stablecoins. By holding only one type of asset, failure of that asset for any reason would be highly detrimental; however, by providing liquidity to an Equality pool, you are effectively ensuring exposure to a basket of multiple assets of a similar nature.

StableSwap Invariant

Each pool within Equality contains multiple stablecoins. Each pool has several parameters including target proportions of each token, the fee for rebalancing, and the level of fungibility between tokens.

In order to keep target proportions for each token in balance, Equality will charge or refund users a "rebalancing fee." For example, let's assume there is a pool of stable Balance Dollars (bnUSD) and Bridge Dollars (bUSD), with target proportions set at 50% bnUSD and 50% bUSD.

If the current balances are indeed 50% bnUSD and 50% bUSD, there will be no rebalancing fee. However, if the current balances are 25% bnUSD and 75% bUSD, a trader will pay a small rebalancing fee if they buy bnUSD with bUSD, but will get a small refund (negative fee) if they buy bUSD with bnUSD. The fee structure is meant to incentivize traders to re-align the pool balance toward the target balance.

To calculate the rebalancing fee, Equality utilizes the StableSwap invariant.

For the sake of breaking down this invariant, let's look at its component parts.

Let n represent the number of stablecoin types comprising a given pool.

$$\sum_{i=1}^{n} x_i = P$$

If our sole concern was maintaining a consistent total balance in the pool, we could utilize the constant sum invariant as shown above, where x_i is the quantity of a stablecoin in the pool. P represents the total size of the

pool. The downside of this invariant is that it could lead to a single stablecoin type comprising the entirety of a pool. Without the ability to make it more expensive to swap one stablecoin for another, this invariant fails to fulfill our goal.

On the other side of the spectrum is a constant product invariant:

$$\prod_{i=1}^{n} x_i^{w_i} = C$$

In this formula, x_i still represents the quantity of a stablecoin while w_i is the normalized weight:

$$\sum_{i=1}^{n} w_i = 1$$

When C is held constant, the invariant results in price changes when the quantities change. The constant product invariant shown above can be found in the Balancer protocol and is derivative of Uniwap's algorithm.

Neither of these invariants are ideal for our purposes; the constant sum invariant can lead to uniformity in a pool, whereas the constant product invariant can lead to excessive price volatility.

The StableSwap invariant ultimately combines both invariants with a scalar s to ensure the stable nature of our similarly-priced tokens is accounted for:

$$s \times \sum_{i=1}^{n} x_i + \prod_{i=1}^{n} x_i^{w_i} = C$$

If *C* is held constant, when *s=0*, the function operates as a constant product invariant and operates like the constant sum invariant as *s* nears infinity.

In practical terms, as *s* increases, the "rebalancing fee" is reduced (including the possibility of turning negative).

Fees

In addition to the rebalancing fee, all trades on Equality will also have a small transaction fee of 0.04% and an administrative fee of 0.02%.

Transaction fees will be used to directly compensate current liquidity providers. The administrative fees will be set aside into a DAO fund to be used at the discretion of EQU token holders.

Pools

Equality will ultimately offer a number of different pools that users may be able to trade and provide liquidity within. Each pool will likely offer varying degrees of risk and reward, so each user will need to evaluate what's best for them based on their risk tolerance.

While the number and type of pools will likely vary over time, Equality will initially launch with only an interest-bearing OMM pool that will provide users with additional APY by utilizing the Open Money Market (OMM) protocol to earn more interest for liquidity providers.

If additional lending platforms become available on the ICON network, additional pools will likely be added, giving Equality liquidity providers the option to select which pool best matches their risk profile.

Furthermore, as more IRC-2 stablecoins become available, pools will also be added and/or expanded.

Equality Token Economics

The primary purpose of the Equality Token (EQU) is to incentivize liquidity providers on the Equality protocol and serve as a mechanism for decentralizing the protocol's governance.

Equality Tokens (EQU) represent ownership in the Equality DAO. EQU holders are entitled to governance rights and a share of transaction fees.

The circulating supply of EQU will be 0 at launch. For the first 60 days, the daily minted amount of EQU will equal 100,000. After 60 days, the amount minted per day will fall by 0.5% relative to the prior day.

80% of the daily minted EQU will be distributed to liquidity providers with 20% distributed to early contributors, via Equality Worker Tokens (EWT). Liquidity providers will receive EQU based on the total amount of liquidity they are providing relative to the total liquidity within the protocol, as specified in the below formula:

(User's total liquidity / Total Liquidity on Equality) x EQU Allocation to Liquidity Providers

DAO Fund

In order to fund further development of the platform over the long-term, a portion of the admin fees charged by the protocol will be set aside into the Equality DAO Fund. Holders of EQU will have governance rights over how

to best utilize the DAO fund in a manner that allows for the long-term growth and sustainability of the platform.

Governance

Equality is a decentralized autonomous organization (DAO) that is owned and operated by those who hold EQU tokens.

EQU holders have the ability to participate in governance decisions, based on their pro-rata share of EQU. The governance powers of Equality Token holders include, but are not limited to:

- Adjusting transaction fees
- Adjusting EQU inflation rates
- Adjusting EQU inflation allocations
- Adjusting the Equality governance process
- Spending the Equality Tokens held in the DAO fund
- Adding new pools
- Adding or removing assets from existing pools

Equality Worker Tokens

EWT provides holders with pro-rated rights to 20% of the distribution of EQU tokens and serve as a form of fungible incentives for early contributors to the project. EQU token holders may adjust the proportion of minted EQU that EWT holders are entitled to.

Early Contributors

Tom Nguyen - TNTXT P-Rep Founder & Team Lead

Tom is an avid software engineer with 15+ commercial experience in enabling financial services & technologies alignment for various Australian companies and financial institutions. He specializes in building complex and robust FX & derivative trading software systems. After too many years working in a corporate environment, Tom has decided to retire and move back to Vietnam to do his own things.

In 2017, he discovered various opportunities in the blockchain space and has dedicated most of his time to exploring smart-contract development, token-economics and decentralized finance. He spent 6 months working days and nights attempting to build a security-token exchange based on Stellar DEX but later abandoned due to lack of interest and the short-lived STO trend.

He founded TNTXT (formerly ICONVIET) P-Rep team in 2019 with other local fellows in the international ICON community and now working full-time on his own leading a small local dev-team specializing in development on ICON network.

Scott Smiley – ICX Station Co-Founder, ICON Strategy Team

Scott earned his Master of Science in Finance (MSF) from Vanderbilt University in 2016, followed by two years of Investment Banking experience at Deutsche Bank specializing in Asset Backed Securities.

During his time at Deutsche Bank he dedicated his nights and weekends to self education on the nascent blockchain and cryptocurrency space, eventually leading to his current role as Co-Founder of ICX Station and member of ICON's Strategy Team since April of 2018.

Kevin Newby - ICONation Co-Founder

Kevin has over 10 years of professional experience as a project manager, systems administrator and scrum master. He is a cryptocurrency enthusiast and Co-Founder of the ICONation Public Representative (P-Rep) team. His roles with the ICONation team include serving as an author and videographer for ICONation related content.

ICONOGRAPHER - RHIZOME Team Member

ICONOGRAPHER has been involved in the ICON ecosystem for nearly two years providing in-depth analysis and coverage of the latest news and developments within the ecosystem.

His most notable works include the lengthy ICON 101 series, a multi-part breakdown of the ICON ecosystem, as well as the the Guide to ICON DeFi, which provides an introduction to a number of decentralized finance protocols and the ways in which DeFi can become prominent.