Peg Whitepaper v2.0

The PEG Network is an innovative protocol for creating customized asset-pegged tokens. Through PEG Network anyone can create an ERC-20 token pegged to a currency, commodity or underlying asset of their choice by depositing collateral and issuing themselves a loan. These tokens will exhibit the price stability necessary to carry out the fundamental functions of money, serving as a means of exchange, store of value and unit of account.

What are asset-pegged tokens?

When Satoshi conceived of the Bitcoin blockchain, he envisioned a peer-to-peer cash system that would replace traditional forms of money. However, bitcoin's extreme price volatility makes it unsuitable for fulfilling the functions of money. This has led to the proliferation of cryptocurrencies pegged to traditional fiat currencies in an effort to achieve price stability, known collectively as stablecoins. PEG extends the price-stabilizing benefits of stablecoins by offering market participants a choice of assets to which their token will be pegged. While traditional stablecoins are mostly pegged to the US Dollar, PEG tokens can be pegged to alternative fiat currencies, the price of commodities such as gold and oil or any other real-world asset. Creating asset-pegged tokens requires depositing PEG as collateral into a Collateralized Reserve Entity (CRE), or a "Vault" which originates a loan for the corresponding amount of tokens issued.

The PEG Token

PEG serves as a universal collateral token used to issue and stabilize asset-pegged tokens. Any user can deposit PEG as collateral in order to issue themselves tokens pegged to a currency, commodity or real-world asset of their choice. PEG token is backed by Bancor's Liquidity Network allowing for instant conversion between PEG and any other ERC-20 token on Bancor Network.

PEG Instance

A Peg Instance is the management layer responsible for setting the terms for creating and maintaining an asset-pegged token.

Responsibilities of Instance managers include:

- **Setting the sensitivity of price stability mechanisms.**

In order to ensure that the price of a given asset-pegged token moves in tandem with the price of the underlying asset, PEG network employs price stability mechanisms that are activated whenever the token price deviates from the target price of the underlying asset. Determining exactly when these price stability mechanisms are triggered is the role of the Instance manager.

- **Setting the collateral ratio and liquidation threshold**

Issuing new asset-pegged tokens requires a deposit of PEG tokens as collateral which generates a loan equivalent to the new tokens issued. Should the value of the collateral fall below a given threshold, any user can call the liquidation function allowing them to pay back the outstanding loan and retrieve the collateral. Both the ratio of collateral deposited to new tokens issued as well as the liquidation threshold are the responsibility of the Instance manager

- **Maintaining price oracles**

Reliable, up-to-date price information is crucial to the successful functioning of asset-pegged tokens. An oracle is a price reporting mechanism that is either centrally-managed or controlled by a group of people comprising a decentralized autonomous organization (DAO). A centralized price oracle will be responsible for feeding the network

with accurate price data initially, with the responsibility shifting to trustless DAOs as the network matures. The primary purpose of the price oracle is to determine the maximum loan to be borrowed as well as the liquidation threshold.

Examples of Instance managers include:

- Fund managers and bankers looking to create blockchain-based derivative products.
- Exchanges wishing to deal with foreign currencies (forex)
- Businesses needing a local currency which would allow customers to pay for goods and services
- Industries wanting to represent certain commodities as tokens

Collateralized Reserve Entity (CRE): The "Vault"

A Collateralized Reserve Entity (CRE), or "Vault" is a user-owned smart contract collateralized by PEG tokens. Users can issue asset-pegged tokens by depositing collateral into a Vault which is tied to a parent Peg Instance. This incurs a loan which must be repaid in order to release the collateral. Vault creators may wish to borrow against crypto collateral by depositing PEG into a vault and issuing asset-pegged tokens in return.

Monetary incentives for Instance and Vault creators

There are four main monetary incentives for Instance and Vault creators.

1. Instance creators can set the terms of the Instance contract to mint themselves X amount of tokens over Y amount of time allowing them to cover the cost of maintaining the oracle and leaving themselves room for profit. The terms of the minting of tokens should be disclosed in advance by the Instance creator.
2. Both Instance and Vault creators can fund a Relay contract and in exchange for a 1% flat fee on total volume traded . This will provide them revenue every time the Relay is used.
3. Collateralizing a vault function as an alternative shorting mechanism for traders. Traders who believe that the price of a given asset will decrease in the future can mint tokens pegged to said asset and sell them on the market. Once the price of the given token drops, they can buy back the amount of tokens necessary to repay their loan and release their collateral at a discount.
4. Vault creators can also earn by utilizing arbitrage opportunities. They would mint an equal amount of asset-pegged tokens to the real world asset they hold and buy and sell each depending on the discrepancy of the market price.
5. Liquidating a loan

PEG Price Stability Mechanism

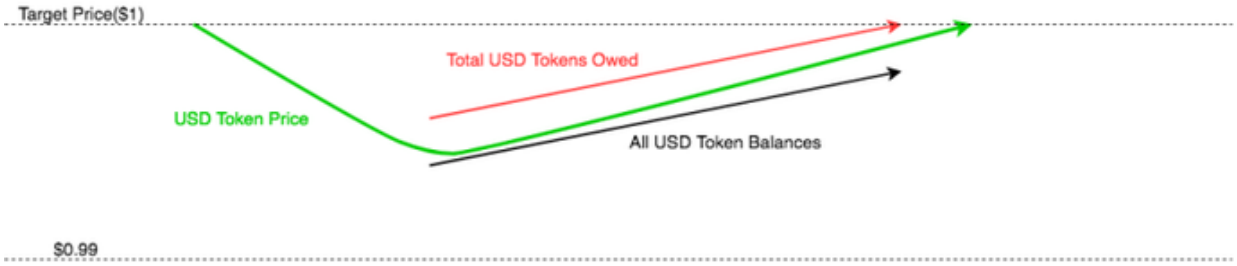
There are three methods by which the PEG network ensures that the price of the pegged assets converges on the targeted price of the underlying asset. The first is due to natural market forces while the latter two are proprietary PEG network stability mechanisms.

Firstly, a natural arbitrage opportunity arises when the price of the custom token deviates from its peg. Traders expecting the market to correct the price of an asset-pegged token will buy any token whose price is lower than the target price of the underlying asset and sell any token trading at a premium to the target price. Additionally, when the token trades below targeted value, the token issuer can purchase more asset-pegged tokens to pay back their loan at a discount. Purchase pressure drives the price upwards.

Furthermore, we introduce two price balancing mechanisms called **debt scaling** and **wallet scaling** mechanisms. Whose purpose is to magnify the natural market forces which already provide stability serving as levers allowing the PEG

Network to adjust the demand and supply. In the following explanation of PEG Network's price-stability mechanism, assume a USD-pegged token is issued in exchange for collateralizing a Vault with sufficient PEG reserves.

Asset-pegged token trading at a discount to target price



The graph demonstrates a situation whereby the token is initially trending toward a value below $1 USD, the target value. When the token price breaks a set threshold, the ReportPriceToTargetValue function is called, scaling up both tokens owed (debt scaling) and total token balances (wallet scaling). This creates two separate economic forces that work in tandem to push the price of the USD token upwards, towards the target price line. These two economic forces can be described as follows:

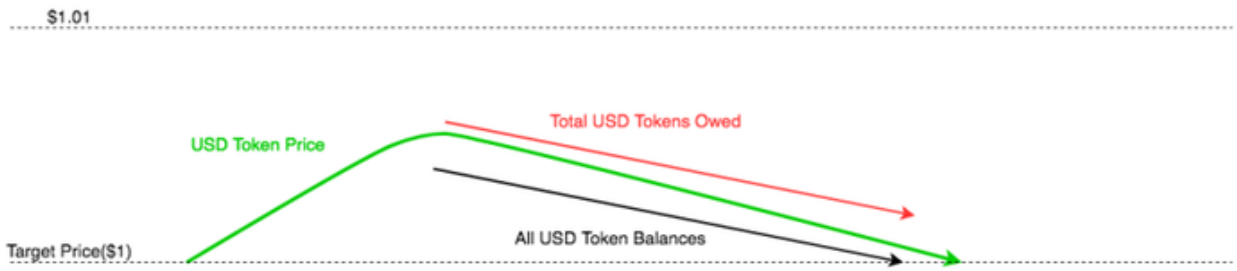
Debt Scaling Up

Bob has issued 100 USD-pegged tokens by collateralizing his Vault with 1000 USD worth of PEG tokens and taking out a loan against them. The low price threshold is set at $0.995. When the price drops below the threshold, the ReportPriceToTargetValue function is called and the amount of USD tokens owed to his Vault begins to increase. Bob and his fellow loan holders are now effectively being charged for their loan, as the amount of asset-pegged tokens needed to repay the loan is increasing. They will seek to buy PEG:USD tokens on the market in order to repay all or some of their loans, creating purchase pressure from these loan holders.

Wallet Scaling Up

Alice is a regular user who simply holds a balance of 100 USD-pegged debt tokens in her wallet. Once the price breaks below the lower threshold, the ReportPriceToTargetValue function is called and the amount of USD tokens owned in her wallet begins to go up. Alice is now making money by simply holding a balance of USD-pegged tokens. She is incentivized not only to hold, but to purchase more USD tokens so long as her balance is scaling up in proportion to the number of tokens in her wallet. This creates purchase/hold demand for the USD token, putting upward price pressure on the token price.

Asset-pegged token trading at a premium to target price



The graph demonstrates a situation whereby the token is initially trending toward a value above $1 USD, the target value. When the token price breaks a set threshold, the ReportPriceToTargetValue function is called, scaling down both tokens owed (debt scaling) and total token balances (wallet scaling). This creates two separate economic forces that work in tandem to push the price of the USD token upwards, towards the target price line. These two economic forces can be described as follows:

Debt Scaling Down

Bob has issued 100 USD-pegged tokens by collateralizing his Vault with 1000 USD worth of PEG tokens and taking out a loan against them. The high price threshold is set at $1.005. When the price breaks the threshold, the ReportPriceToTargetValue function is called and the amount of USD tokens owed to his Vault begins to decrease. Bob and his fellow loan holders are now effectively being paid for their loan, as the amount of asset-pegged debt tokens needed to repay the loan is decreasing. They will seek to create more asset-pegged tokens which he can then sell at a premium on the open market, creating sell pressure from these loan holders.

Wallet Scaling Down

Alice is a regular user who simply holds a balance of 100 USD-pegged debt tokens in her wallet. Once the price breaks the high price threshold, the ReportPriceToTargetValue function is called and the amount of USD tokens in her wallet begins to decrease. Alice is now losing money by simply holding a balance of USD-pegged debt tokens. She is incentivized to spend or sell her tokens in anticipation of a further drop in her balance so long as her balance is scaling down. This puts downward price pressure on the USD-pegged token.

Exchanging between asset-pegged tokens

PEGDEX is a decentralized application built on the Bancor relay model where asset-pegged tokens can be trustlessly exchanged for one another without the need of a buyer or seller. Using PEGUSD as a connector token, PEG Instance managers can set up smart contract-managed reserves to provide instant liquidity for their tokens.

PEGUSD

The first PEG Instance live on PEG network is a USD-pegged stablecoin, PEGUSD. In addition to PEG Network's price stability mechanisms, the PEGDEX contributes to the maintaining the USD-peg of PEGUSD as the increased liquidity allows for more accurate price discovery. PEGUSD will be exchangeable for both crypto and fiat, facilitating the creation of no-interest loans via the PEG network.

Protecting Network Solvency

PEG network requires an over-collateralization of all asset-pegged tokens it creates, inserting a margin between the value of the collateral and the value of asset-pegged tokens created. In the event that the Vault becomes under-collateralized, anyone can call the liquidation function to close the Vault and dissolve the collateral. Once a liquidation event is initiated, the liquidator is responsible for paying off the outstanding loan in order to dissolve the Vault and receive the unlocked collateral. If a Vault is under-collateralized at any point, any user can pay off the existing debt in exchange for the total PEG collateral in that particular vault.

PEG Network Benefits

Tokenization: Tokens can be pegged to any underlying currency, commodity or asset.

Borrow: Utilize your assets to provide yourself a stable loan that can be repaid at any time.

Hedge: Safely hedge your crypto against an asset-pegged token of your choice.

Liquidity & Trading: Instant liquidity between any token-pegged asset and any other ERC-20 token on PEGDEX utilizing Bancor Protocol

Stability: Aside from usual price stabilizing market-mechanics, the PEG network contains built-in proprietary market mechanics to maintain the stability of asset-pegged tokens.

With EOS and Tron on our roadmap and "atomic swap" capabilities connecting both chains, PEG Network envisions a vibrant, blockchain-agnostic marketplace for tokens pegged to a wide variety of currencies, commodities and underlying assets.

-