

Part III:

DeFi Deep Dive

4. Tokenization

(i) Set Protocol

Tokenization

What is tokenization?

- Tokenization refers to the process of taking some asset or bundle of assets, either on or off chain, and
 1. representing that asset on chain with possible fractional ownership, or
 2. creating a composite token that holds some number of underlying tokens.
- A token can conform to different specifications based on the type of properties a user wants the token to have.
- The most popular token standard is ERC-20, the fungible token.

Tokenization

What is tokenization?

- ERC-20 defines abstractly how a token, which has units that are non-unique and interchangeable (such as USD), should behave.
- ERC-721 standard defines nonfungible tokens (NFTs). These tokens are unique, such as a token representing ownership of a piece of fine art or a specific digital asset from a game.
- DeFi applications can take advantage of these and other standards to support any token using the standard simply by coding for the single standard.

Tokenization: Set Protocol

**The standard for
tokenized baskets**

What is Set Protocol?

- [Set Protocol](#) offers the “composite token” approach to tokenization.
- Set Protocol combines Ethereum tokens into composite tokens that function more like traditional exchange traded funds (ETFs).
- Set Protocol combines cryptoassets into *Sets*, which are themselves ERC-20 tokens and fully collateralized by the components escrowed in a smart contract.

Tokenization: Set Protocol

Static Sets

- A Set token is always redeemable for its components.
- Sets can be static or dynamic, based on a trading strategy.
- Static Sets are straightforward to understand and are simply bundled tokens the investor cares about; the resulting Set can be transferred as a single unit.

Tokenization: Set Protocol

Static Sets

- DeFi Pulse creates a portfolio of DeFi tokens



DeFi Pulse Index

The DeFi Pulse Index is a capitalization-weighted index that tracks the performance of decentralized financial assets across the market.



By DeFi_Pulse

<https://www.tokensets.com/portfolio/dpi>

Name	Market Cap	Price	1 Day	1 Week	1 Month	3 Months	Since Inception
DeFi Pulse Index	\$143,412,879.35	\$323.74	↑ +2.3%	↑ +6.6%	↑ +5.9%	↓ -40.1%	+174.9%
	UNI 25.38%	AAVE 20.65%	MKR 13.47%	COMP 10.69%	+10 more		

Tokenization: Set Protocol

Dynamic Sets

- Dynamic Sets define a trading strategy that determines when reallocations can be made and at what times.
- Some examples include the “Moving Average” Sets that shift between 100% ETH and 100% USDC whenever ETH crosses its X-day simple or exponentially weighted moving average.
- Similar to normal ETFs, these Set tokens have fees and sometimes performance-related incentives.

Tokenization: Set Protocol

Dynamic Sets

- At the Set's creation, the manager pre-programs the fees, which are paid directly to the manager for that particular Set.
- The available fee options are:
 1. buy fee (front-end load fee),
 2. streaming fee (management fee), and
 3. performance fee (percentage of profits over a high-water mark).
- The Set Protocol currently takes no fee for itself, although it may add a fee in the future.

Tokenization: Set Protocol

Dynamic Sets

- At the Set's creation
- Ember Fund's "**The Quant**" leverages machine learning and regression analysis to generate signals to automatically rebalance between Bitcoin and a Stablecoin. This portfolio is constructed in partnership with [Blockforce Capital](#), a leading multi-strategy cryptocurrency hedge fund for institutional investors.




The Quant




Ember
Set Creator

\$4,602,041.66
Market Cap

December 28th 2020
Inception Date

 The Quant

Underlying Tokens

 Bitcoin	0.002915 WBTC	\$41148.38	95.62%
 USD	5.499184 USDC	\$1.00	4.38%

Tokenization: Set Protocol

Oracle

- The prices and returns for Set Protocol are calculated via MakerDAOs' publicly available oracle price feeds, which are also used by Synthetix.
- The main value-add of dynamic Sets is that the trading strategies are publicly encoded in a smart contract so users know exactly how their funds are being allocated and can easily redeem at any time.

Tokenization: Set Protocol

Social trading

- Set Protocol also has a *Social Trading* feature in which a user can purchase a Set whose portfolio is restricted to certain assets with reallocations controlled by a single trader.
- Because these portfolios are actively managed, they function much more like mutual or hedge funds.
- The benefits are similar in that the portfolio manager has a predefined set of assets to choose from, and the users benefit from this contract-enforced transparency.

Tokenization: Set Protocol

Example

- A portfolio manager for a Set has a goal to “buy low and sell high” on ETH.
- The only assets she can use are ETH and USDC, and the only allocations she is allowed are 100% ETH and 100% USDC.
- At her sole discretion, she can trigger a contract function to rebalance the portfolio entirely into one asset or the other; this is the only allocation decision she can make.

Tokenization: Set Protocol

Example

- Assume she starts with 1,000 USDC. The price of ETH dips to 100 USDC/ETH and she decides to buy.
- She can trigger a rebalance to have 10 ETH in the Set.
- If the price of ETH doubles to \$200, the entire Set is now worth \$2,000.
- A shareholder who owns 10% of the Set can redeem her shares for 1 ETH or 200 USDC.

Tokenization: Set Protocol

Summary

- Sets could democratize wealth management in the future by being more peer to peer, allowing fund managers to gain investment exposures through nontraditional channels and giving all investors access to the best managers.
- Many use cTokens, (Compound) earning interest through the Compound protocol.
- This is one example of DeFi platforms being composed (*DeFi Legos*) to create new products and value for investors.

Tokenization: Set Protocol

Traditional Finance Problem	Set Protocol Solution
<i>Centralized Control:</i> Fund managers can control their funds against the will of investors.	Enforces sovereignty of the investor over their funds at the smart contract level.
<i>Limited Access:</i> Talented fund managers often are unable to gain exposures and capital to run a successful fund.	Allows anyone to become a fund manager and display their skills using social trading features.
<i>Inefficiency:</i> Many arising from antiquated practices.	Trading strategies encoded in smart contracts lead to optimal execution.
<i>Lack of Interoperability:</i> Difficult to combine assets into new packages and incorporate the combined assets into new financial products.	Set tokens are ERC-20 compliant tokens that can be used on their own in other DeFi protocols. For example, Aave allows Set token borrowing and lending for some popular Sets.
<i>Opacity:</i> Difficult to know the breakdown of assets in an ETF or mutual fund at any given time.	Total transparency into strategies and allocations of Set tokens.

Part III:

DeFi Deep Dive

4. Tokenization

(ii) Wrapped Bitcoin

Tokenization: WBTC



What is WBTC?



- The [WBTC](#) application takes the *representing off-chain assets on chain* approach to tokenization, specifically for BTC.
- Wrapped bitcoin or wBTC allows BTC to be included as collateral or liquidity on all of the Ethereum-native DeFi platforms.

WBTC used in Set Protocol

The Quant			
Underlying Tokens			
Bitcoin	0.002915 WBTC	\$41148.38	95.62%
USD	5.499184 USDC	\$1.00	4.38%

Tokenization: WBTC



What is WBTC?

- Given that BTC has comparatively low volatility to other cryptocurrencies and is the most well-adopted cryptocurrency by market-cap, this characteristic unlocks a large potential capital pool for DeFi dApps.
- See white paper: <https://wbtc.network/assets/wrapped-tokens-whitepaper.pdf>

Tokenization: WBTC

Stakeholders

- The WBTC ecosystem contains three key stakeholders: users, merchants, and custodians.
- Users are simply the traders and DeFi participants who generate demand for the value proposition associated with wBTC, namely, Ethereum-tokenized BTC.
- Users can purchase WBTC from merchants by transferring BTC and performing the requisite KYC/AML, thus making the entry and exit points of wBTC centralized and reliant on off-chain trust and infrastructure.

Tokenization: WBTC

Stakeholders

- Merchants are responsible for transferring WBTC to the custodians.
- At the point of transfer, the merchant signals to an on-chain Ethereum smart contract that the custodian has taken custody of the BTC and is approved to mint WBTC.

Tokenization: WBTC

Stakeholders

- Custodians use industry-standard security mechanisms to custody the BTC until it is withdrawn from the WBTC ecosystem.
- Once the custodians have confirmed receipt, they can trigger the minting of WBTC that releases WBTC to the merchant.
- Finally, closing the loop, the merchant transfers the WBTC to the user.

Tokenization: WBTC

Stakeholders

- No single participant can control the minting and burning of WBTC, and all BTC entering the system is audited via transaction receipts that verify custody of on-chain funds.
- These safeguards increase the system's transparency and reduce the risk to users that is inherent in the system.
- Because the network consists of merchants and custodians, any fraud is quickly expungable from the network at only a small overall cost versus the cost that would be incurred in a single centralized entity.

Tokenization: WBTC


Governance

- The mechanism by which merchants and custodians enter and leave the network is a multi-signature wallet controlled by the WBTC DAO.
- The DAO does not have a governance token; instead, a set of owners who can add and remove owners controls the DAO.

Tokenization: WBTC

Governance

- The contract currently allows a maximum of 50 owners, with a minimum threshold of 11 to invoke a change.
- The numbers 50 and 11 can be changed, if the number of conditions are met.
- This system is more centralized than other governance mechanisms we have discussed, but is still more decentralized than allowing a single custodian to control all of the WBTC.

					Market cap	Volume	
☆	14	 Wrapped Bitcoin	WBTC	\$32,465.28	▲ 0.63% ▼ 13.07%	\$3,700,425,918	\$197,270,245 6,140 WBTC

Tokenization: WBTC



Eth: \$2,643.72 (+7.57%) | 64 Gwei

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Token Wrapped BTC

Wrapped Bitcoin Bitcoin Pegged

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Gaming

Announcement: London network upgrade is happening at block **12,965,000**. Update your node (with 23rd July release) to the **latest client version!**

Overview [ERC-20]

PRICE
\$41,466.00 @ 15.684717 Eth (+0.14%)

FULLY DILUTED MARKET CAP ⓘ
\$7,981,140,768.24

Max Total Supply: 192,474.33483435 WBTC ⓘ

Holders: 34,719 (▲ 0.173%)

Transfers: 2,369,715

Profile Summary [Edit]



Contract: [0x2260fac5e5542a773aa44fbcfedf7c193bc2c599](#)

Decimals: 8

Official Site: <https://www.wbtc.network/>

Social Profiles:

Tokenization: WETH

What is WETH?

- ETH is not an ERC-20 token
- Hence, many DeFi protocols use WETH, a wrapped version of ETH, that is pegged to ETH
- In contrast to WBTC, everything happens in the same chain, Ethereum
- Hence, WETH is completely decentralized

Tokenization: WETH

What is WETH?

- In the future, WETH will disappear. Steps are being taken to make ETH compliant with its own ERC-20 standards!
- ERC-223 already exists. It allows token transfers to behave exactly as ether transactions
- ERC-223 seeks to replace the ERC-20. The ERC-223 adds an additional parameter to the transfer function to allow for more complex and safer operations.

Tokenization: WETH

There are lots of important ERCs!

- ERC-223 (LINK is ERC-223)
- ERC-621 (allows increase, decrease in supply)
- ERC-721 (allows for NFTs)
- ERC-827
- ERC-1155 (multi-token standard)
- ERC-3156 (flash loans)

Asymmetric-key-cryptography
Scaling-risk AMM Proof-of-stake
Yield-farming Vertical-scaling DEX Nonce
Sharding Slashing KYC Address
Vampirism Mint Invariant DAO
Schelling-point-oracle Direct-incentive
Optimistic-rollup Halting-problem Testnet ERC
EOA Airdrop Fork Oracle
Keeper Smart-contract
Double-spend Gas Hexadecimal Burn Miner PoS
Defi-Legos Consensus-protocol Layer Mainnet
Flash-swap Horizontal-scaling Utility-token
Flash-loan Node PoW IDO Contract-account dApp
Vault Digest Stablecoin Router-contracts Symmetric-key-cryptography
Bonding-curve Impermanent-loss
Hash Governance-token DeFi
Proof-of-work
Staking





Next part: IV. DeFi Risks and Opportunities

Next

- We will do an analysis of the major risks in the DeFi space including: Smart contract risk; Governance risk; Oracle risk; Scaling risk; DEX risk; and Environmental and Regulatory risk.