TokenBlocks

Fund Tokens v1.1

An Industry Driven Standard to Spark Adoption

Introduction

The ST-20 and R-Token standards have provided a great starting point for the Security Token market. These standards are paramount for industry adoption, helping drive confidence in the new digital asset class.

However, the existing standards are incredibly generic when it comes to specific asset classes preventing them from being fit for purpose.

Below we focus on open-ended funds, defining a standard with the interests of investors and a well-functioning market at its core. The standard is based on 3 principles:

1. Delegated responsibilities and accountability across participants
2. Technology agnostic
3. Asset class specific and fit for purpose

Industry input is key to the project and we actively encourage any and all feedback.

Delegating Responsibility

One feature of previous standards was the step to move regulatory compliance from the trading venue and embed it directly in the smart contract which defines the digital asset.

This moved KYC and AML compliance from the exchange to the token and created a more comprehensive approach to preventing malicious players from participating in the network.

We believe this can and should be extended with well-defined responsibilities split between key components of the trading lifecycle. As an example, the token should enforce a mechanism to protect current investors from transaction costs due to large inflows (dilution levies). An exchange, however, would be responsible for ensuring an investor is made whole if the other side of their trade is not honoured.

Both have a responsibility over investor protection.

Technology Agnostic

We aim to be technology agnostic, believing that many blockchains are likely to emerge as institutions each build their own private versions. A standard should not be blockchain specific although it should provide constraints on the nature of the blockchain. As an example, a public blockchain can be made to satisfy the requirement of “Investor Privacy” by using zero knowledge proofs to maintain investor anonymity instead of using a permissioned blockchain.

Fit for Purpose

The first widely adopted standard for tokens, ERC-20, did not stipulate rules around regulating ownership. With the view of being the standard for “Security Tokens”, ST-20, extended the scope to include rules-based management through whitelisting ownership. ST-20 however says nothing about the creation and redemption of new units, a key feature of open-ended funds.

ST-20 went on to describe mechanisms for the distribution of dividends and management of other corporate action events but this still does not cover key functionality required for the trading of a fund such as the

need to deal with swing pricing and dividend equalisation. Until this functionality has been incorporated ST-20 will never be fit for the open-ended fund market.

Fig 1: Key components of a distributed market

The Fund Standard

Some features of the standard are functional and require enforcement via code. Others are properties stored on the ledger providing an auditable method of disclosure to all investors. Finally, some features are processes and are expected to be enforceable by off chain rules and/or terms of business of the Token Issuer.

1. Regulatory Compliance
    a. Investors must have been whitelisted by undergoing valid Know Your Customer (KYC) and Anti-Money Laundering (AML) checks
    b. A digital share must be able to differentiate between types of participants such as retail, professional, institutional etc.
    c. Jurisdiction of the investor must be known to manage cross border sales, regulations and taxes.
    d. Counterparties must be able to define specific relationships allowing flexibility in trading depending on relationship-based rules.
    e. All relevant disclosures and disclaimers prior to investment and during the management of the fund. This includes the issuing of KIIDs and Prospectuses to investors
    f. Trade reporting through a venue or Approved Publication Arrangement (within the needs of regulatory reporting standards).

2. Governance around Investor Protection
    a. Unless an investor chooses to opt-out it should be encouraged that settlement takes place at a regulated digital custodian
    b. Adequate processes in place to ensure off market transactions do not occur without appropriate justifications. I.e. such as through the use of a designated sponsor or “Market Maker” who has obligations with regards to liquidity
    c. A mechanism for recovering ownership or providing insurance in the case of lost or stolen private keys
    d. All information on the funds strategy and structure must be easily accessible
    e. There must be a centrally accountable entity for the orderly functioning of the token
    f. Robust governance and process around upgrading the ledger and token specific code. This requires considerations due to the immutability of the technology.
    g. A mechanism to disclose any unexpected events which can cause moves in the NAV of the fund

3. Fund Specific Functionality
    a. Must be able to handle ongoing subscriptions and redemptions of units and ALWAYS have a price vs NAV during normal market hours and conditions.
    b. The ability to pay and manage dividends (where necessary by the share class) and other corporate actions
    c. The ability to deal with dilution levies and/or swing pricing to protect investors in the case of large inflows/outflows
    d. The ability to have a lending market. Key for allowing market makers to provide liquidity.
    e. Must be able to enforce privacy where needed and desired.
    f. Must enforce a 1:1 relationship with legal entities for accountability
    g. Must enforce the finality of a transaction near instantaneously
    h. Must provide provenance of ownership

Delegating Responsibilities

		Issuer	Blockchain	Token	Venue	Custodian
Regulation	KYC / AML	✓		✓	✓	✓
	Trading Relationships			✓	✓	
	Investor Jurisdiction			✓		
	KIIDs / Prospectus	✓				
	Ownership Provenance		✓			
	Fund Reporting	✓				
	Trade Reporting				✓	
Trading	Asset Custody					✓
	Price Discovery				✓	
	Liquidity		✓		✓	
	Primary Market Access			✓		
	Lending/ Borrowing			✓	✓	✓
	Corporate Actions	✓		✓		✓
Governance	Ownership Recovery	✓				✓
	Investor Privacy		✓			
	Technology Updates	✓		✓		
	Interoperability	✓				
	Accountability	✓			✓	✓

Fig 2: Delegated responsibilities across the key components of trading a fund

Properties that must be defined for a Fund Token:

1. Jurisdiction of the fund
2. Legal Structure of the Fund
3. Regulatory Structure of the Fund
4. Allowed Investor Base [Retail/ Institutional/ Professional]
5. Base Currency of the Fund
6. ISIN of the replicated share class
7. Who the regulatory body monitoring the fund is
8. Who disputes can be sent to
9. Income distribution [Accumulating or Distributing]
10. A link to where the KIIDs and Prospectus of the fund can be found
11. The underlying investment strategy of the fund
12. The benchmark of the fund
13. The management fee of the fund

14. Primary Market Minimum entry size
15. Maximum Front Load
16. Maximum Back Load

1. Regulatory Compliance

KYF (Know Your Fund)

Most new security tokens have come to realise that regulation isn't going away and have now built functionality to allow whitelisting of investors.

This is also necessary in the fund world however there is an increased layer of complexity required. New fund tokens must have their legal and regulatory structures defined as this is directly linked to their eligible investor base. Most current solutions have simplified the problem by simply only allowing sophisticated investors or ignoring this detail completely. We aim for a standard that is more generic, actively filtering and matching the investor base with suitable products.

KIIDs and Prospectuses

Another fund specific piece of regulation is the need to provide investors with access to Key Investor Information Documents and Prospectuses before they invest. This becomes tricky with distributed technology as an investor now has many more ways they can access the product without the fund being aware. This would seem to suggest that compliance must now be held at the token level or through the relevant trading venue where the Investor is made aware of all documents before being allowed to conduct a trade in a new fund.

Whitelisting Relationships

Another key difference with our standard is that we redefine how investors are classified. Instead of purely defining an investor type we define relationships between participants. This provides flexibility in rules allowing agreements to be made between individual counterparties and how they treat each other for regulatory reasons. This is key for investor protection as the rules between two banks trading should not be the same as an investor interacting directly with a market maker. It also allows accountability to be delegated when it comes to regulation.

Trade Reporting

Stating the need for trade reporting seems superfluous through the use of a public blockchain as all data is inherently available at all times however as we are technology agnostic there are potential solutions where this may not be the case. Therefore the standard is required to stipulate that all trade data should be made readily available within the requirements of regulations at a trading venue or through an Approved Publication Arrangement (APA).

2. Governance around Investor Protection

The use of distributed technology has the ability to remove almost any central authority. This has the potential to increase risk for investors as it may disintermediate participants who are incentivised to protect investors due to regulation and accountability.

Issuers

A fund manager is responsible for how his investors access the fund. This indirectly makes him responsible for the choice of technology used. Some of this risk can be delegated through the use of business agreements with technology providers however if the wrong provider is chosen and the wrong technology used the fund manager stands to suffer significant reputational damage.

Recovering Lost/ Stolen Private Keys

For investors that choose not to use a digital custodian a recovery process should be put in place in case they were to have their private key lost or stolen. With the use of a distributed ledger there is no longer a Transfer Agent who maintains a verifiable shareholder list. It therefore seems sensible that this responsibility would now sit with the Issuer as ultimately, he has responsibility over his shareholders. Technology can enable the smooth process of verifying a real-world investor using traditional documents in these scenarios but the responsibility for the process sits with the issuer.

Technology Updates

The functionality of a digital token is defined in its smart contract which is deployed to a distributed ledger. As a distributed ledger is immutable this generates a dilemma in which upgrading a token becomes difficult. This needs to be given considerations before a token is issued so that a mechanism for upgrading the code, which effectively involves obsoleting one smart contract with another, can be in-built. This often leads to centralisation and ownership of the token falling with whoever has control of this mechanism. Again, this would be expected to sit with the issuer or a delegated technology provider.

Venues

A decentralised exchange has no credit risk which suggests no need for processes with regards for failed trades as these should theoretically never occur. However just because an exchange is decentralised does not alleviate it of the responsibility to ensure its investors get a fair price for their assets. There is a responsibility to define and uphold policies around which securities are listed for trading and whether they are regulatory compliant and suitable for investors.

Furthermore, an exchange has a responsibility to manage accurate price discovery even during fast markets and times of high volatility. As of yet there is no well-established protocol for a functioning decentralised auction. This would seem to suggest that at least with the current state of technology a centralised exchange is still the best solution for ensuring efficient and orderly markets for fund tokens.

Custodians

Now we move to the responsibilities of the custodian with regards to safeguarding client assets. In the current financial ecosystem assets are held by custodians on behalf of investors. The custodian is required to hold capital to make investors whole again in the case of unforeseen circumstances or operational faults. This process is incredibly important and necessary for protecting investor assets and this accountability is a part of the ecosystem which should not be removed - however it may be replaceable through the use of insurance.

3. Fund Specific Functionality

The first widely adopted standard for tokens, ERC-20, did not stipulate rules around the creation and redemption of new units. In effect it more closely described a standard for close-ended funds. Equally it does not describe mechanisms for the distribution of dividends or managing other corporate action events.

Since then there has been significant development from the open-source community to build out security specific functionality. We provide an open-ended fund specific extension that allows fund specific features such as dilution levies, swing pricing and dividend equalisation. We also hope to extend this further to include switch trades and in-specie primary market orders.

Dilution Levy/ Swing Pricing - The ability of a fund manager to adjust the NAV of a fund to ensure that the costs of a large creation or redemption order are borne by the relevant investor and not other unit holders.

Dividend Equalisation - For tax reasons there is a need to differentiate between dividend income received by the fund before and after the new unit holder purchased the fund. All unit holders receive the same payment when a fund pays a dividend however this is split between normal income and an equalisation payment which is adjusted against an investors' capital gains tax liability when they come to exit their position.

Switch Trades - The ability to switch between different share classes of the same fund. This provides liquidity between share classes in different currencies and a similar dynamic is used to provide liquidity between the digital token and traditional equivalent.

In-specie Orders - The ability to exchange units of the fund directly for a portion of the underlying securities. This is functionality limited to authorised participants of the fund and facilitates liquidity by offering alternative methods of accessing the primary market.

A Lending Market

A lending market is key for facilitating liquidity in securities. Market Makers showing prices in the secondary market need the ability to borrow securities to show offers on funds. Blockchains inherently do not allow participants to sell more than they own, this is fundamental to verifying the validity of a transaction.

This is less of an issue through centralised trading venues and custodians where the pooling of assets allows easy lending dynamics although these must be managed by the exchange.

Alternatively the community has developed protocols to allow decentralised borrowing of assets and these can be leveraged to provide the required functionality.

Choice of Technology

As mentioned the standard is technology agnostic however there are certain features which must be upheld to ensure investor protection and orderly markets. The use of any blockchain must be cross referenced against these features to ensure it is fit for purpose.

The main features include:

Finality - A transaction cannot be uncertain. Especially when high notional values are involved in markets which can move significantly in the space of seconds. A transaction agreed between two parties must be final instantly.

Transaction Anonymity - The only parties that should be aware of a transaction are those required to carry it out. This is important to prevent market manipulations such as front running, especially since funds often trade as a spread to their NAV which means the true price is not defined until later on in the day.

Identity - Each public address must have a concept of identity which is mapped uniquely to a real world entity to enforce the binding nature of a transaction. This does not mean that the identity has to be publicly available but it must be readily accessible on a need to know basis, especially to ensure regulatory compliance.

Scalability - Regardless of the consensus mechanism used to maintain the distributed ledger it should be able to scale with demand. In current decentralised exchanges on Ethereum this is not the case and there is currently a large backlog of pending transactions where one has to pay ever increasing fees to ensure timely settlement.

Adoption - A ledger which has been adopted and tested by the financial community is easier to integrate into pre-existing financial systems. It has been built with finance in mind and has a large, active, financially savvy developer community improving its functionality.