WHITEPAPER

VERSION 0.3pre

SNFT Institute, Leipzig
non-profit-organisation for technical specification
of physical-digital bindings

Abstract

Asset Related Electronic Securities - a new digital representation of the ownership of the physical asset - is uniquely assigned to a physical asset with the SNFT standard. Each representation - a token - corresponds to one asset, and each asset corresponds to only one token.

The SNFT is a fundamentally new standard to multi-secure physical assets and it connect them to the blockchain. Critical data is secured in the SNFT on the blockchain, validation processes are documented digitally by contract on the blockchain.

Physical assets are stored in high-security warehouses as long as the SNFT exists. The SNFT is a proof of ownership and unconditional surrender claim. The SNFT is sufficiently legitimizing without further documents to have the physical asset handed over to the SNFT owner at the warehouse.

Financial regulations generally classify the SNFT as equivalent to the deposited asset.

The owner can use the SNFT in all NFT marketplaces and in NFT-enabled wallets, providing great flexibility to own, transfer, and trade the asset behind it.

The non-profit organization "SNFT Institute" continues to develop the standard and offers interested parties open access to the current development status.

Evolution der Smart Contracts

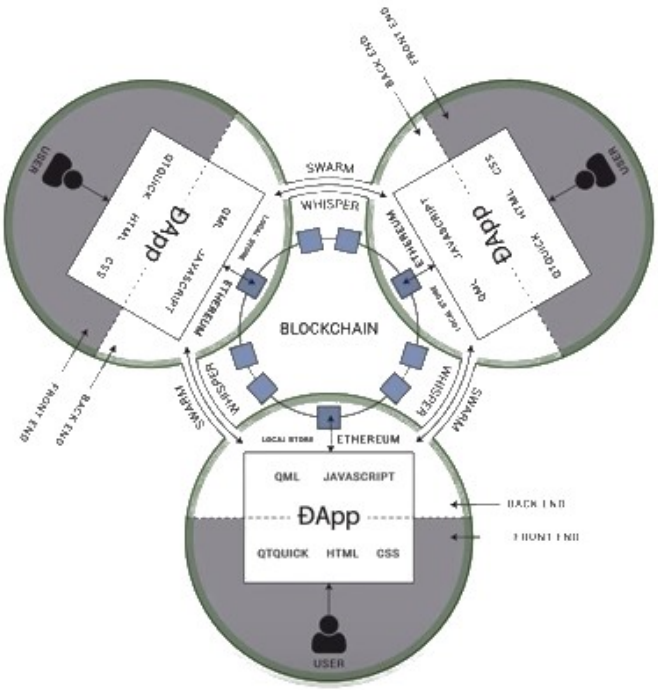
Digitization is advancing steadily, allowing us today to do things that were thought impossible just a few years ago. Communication, entertainment, access control, money and information management on a digital basis should be mentioned as representative of this evolution.

Blockchain is currently considered the most trusted technology for securing data. The collection of records in blocks that are interconnected and encrypted makes it nearly impossible for third parties to steal or falsify data. One use case of blockchain is smart contracts - fully automated contract execution that documents all agreements in a transparent and tamper-proof way.

The idea behind smart contracts dates back to 1993, when computer scientist Nick Szabo coined the term to map auctions and resource management on an information technology level. The basis is small programs that follow clear logics, such as "if-then" rules.

Cryptographic protocols and other digital security mechanisms can be used to verify them. The blockchain provides the basis for transparent and trustworthy data exchange for smart contracts via decentralization, where data is always distributed on multiple servers. This makes concluding a contract with an unknown third party less risky, for example, because the terms of the contract are predefined and monitored. For example, a payment default can be ruled out from the outset.

To ensure that smart contracts also map complex situations without errors, they require constant review and further development. Integration into the physical world cannot be completely covered by the advantages of the blockchain either. Rather, it requires standards to which all parties involved in the lifecycle of a contract are subject. Only the coherent and smooth binding of the interfaces of the contract to the real processes unlocks the full potential of the blockchain and smart contracts.



Picture 1: Users, DApps, Blockchain, [Ethereum StackExchange]

Decentralized applications are used for this purpose (DAapp), which act as an interface between humans and the blockchain. Dialogs and assistants visualize the contents and processes of the smart contracts on the blockchain for the user and request interactions from the same. Technical systems can also be seamlessly integrated and round out processes. The more logic is moved out of the smart contracts into the DApps, the more the underlying purpose loses trust. A review of the apps and the security and trust goals achieved in the context of the smart contracts is therefore imperative.

In this paper, Asset Related Electronic Securities are presented, which make it possible to verifiably secure the ownership of physical assets and make them liquidly tradable.

For this purpose, a procedure has been developed, in the current manifestation of which a smart contract has been created, which is operated on a public blockchain - specifically: Ethereum Mainnet - and with whose token interface can also be traded on this chain, the SNFT.

The SNFT - the secured non-fungible token - is a token that stands for a single asset that is deposited in a secure storage facility in a pre-verified manner - equally specifies a reference contract (smart contract) and all processes that connect it to physical reality.

SNFT Institute

The SNFT is developed as a standard by the SNFT Institute and is available to all interested parties free of charge. The SNFT Institute also operates a generic SNFT DApp independently of other SNFT service providers to allow rudimentary interactions with SNFT contracts to be whitelabeled.

It accompanies research at universities and provides sample contracts and interface specifications to interested parties to standardize the use of SNFT and make this easier for the user.

In addition, the SNFT Institute maintains a publicly viewable registry to certify the

- repository
- tokenizers
- certifiers
- reviewers
- Artists (SNFT of the token subclass ART)
- Tokens (SNFTs)

directly on the blockchain, which should be used by the DApps of the SNFT marketplaces.

Certification is required for the productive use of SNFT technology, for which a number of certifiers are available. The certifiers are regularly trained and evaluated by the SNFT Institute.

The SNFT is specified for different assets, blockchains and compatibility levels.

The first implementation of the SNFT was developed for the art market and Ethereum compatible blockchains.

In collaboration with tax advisors, authorities, and market participants, the SNFT is also being legally defined in a clear manner from a private as well as tax perspective.

Approach of Singular Wrapping

With the SNFT, physical assets can be traded unambiguously, unambiguously and multiple times secured by processes and cryptographic procedures in the blockchain.

It has been determined that each SNFT is assigned to only ONE physical object at a time. This physical item must meet the following criteria as part of the initial implementation:

- non-perishable
- non-biological
- movable
- non-toxic
- storable at humidity 50%-75% and 22°C in darkness.

The SNFT includes a standardized validation process and storage process that is documented on the blockchain for everyone to see. The asset is placed in secured storage. Before placement or upon placement, the asset is appraised. The appraisal is documented on the Blockchain.

The stored asset can be picked up by the owner during business hours of the secure storage facility. After retrieval, the SNFT expires worthless and is digitally incinerated.

All activities are seamlessly documented on the blockchain. Ownership of the deposited item is proven solely through interaction with the SNFT owner's wallet. No further validation of the owner takes place.

SNFT based Etherum Smart Contract

The first SNFT in the implementation "Art.Ethereum.721", hereafter referred to as just "SNFT", is based on a general-purpose Ethereum standard, the ERC721. This compatibility layer allows the SNFT to be used on any NFT-enabled wallet and marketplace.

Each instance of a SNFT has the following characteristics:

- non-fungible
  - not divisible
  - on-chain storage of all data relevant to the contract
- instant authentication of activities
    - authenticity verification,
    - storage transport and putaway
    - Retrieval request, retrieval and acknowledgement
- tradability and exchangeability like an NFT
- publicly viewable activity log
- storage of asset class (previously only "type") and storage class

SNFT/ART specific metadata

The following metadata is stored by the SNFT/ART:

Typology

1 Type: painting, sculpture, print, installation, performance, etc.
2 Artist: name, date of birth, place of birth, place of work currently.
3 Title of the artwork
4 Year of creation of the artwork

Physical

1 Format of the artwork
2 Material of the artwork
3 Edition and index, as well as extent of the edition
4 Description

Historical

1 Previous owners - collections, museums, etc.
2 Places of exhibition over time - collections, museums, galleries
3 Details and interpretations about the artwork

Outside of the blockchain, optional additional media is provided:

1 Image/photo of the artwork
2 Certificate from the artist (scan)
3 Expert opinion - if available with deposit
4 3D object - scan
5 Tokenization order
6 Storage contract of the foundation

SNFT process

Each token is made by a certified tokenizer when commissioned by the owner of the asset to be tokenized.

The artwork is submitted to an SNFT registered appraiser approved for the artwork for appraisal. If a positive authenticity check takes place, this is electronically acknowledged by the appraiser. The appraiser delivers the artwork directly to a certified SNFT bonded warehouse. As a rule, he commissions a security transport for this purpose.

At the bonded warehouse, the storage is also electronically acknowledged. The token now becomes valid and tradable.

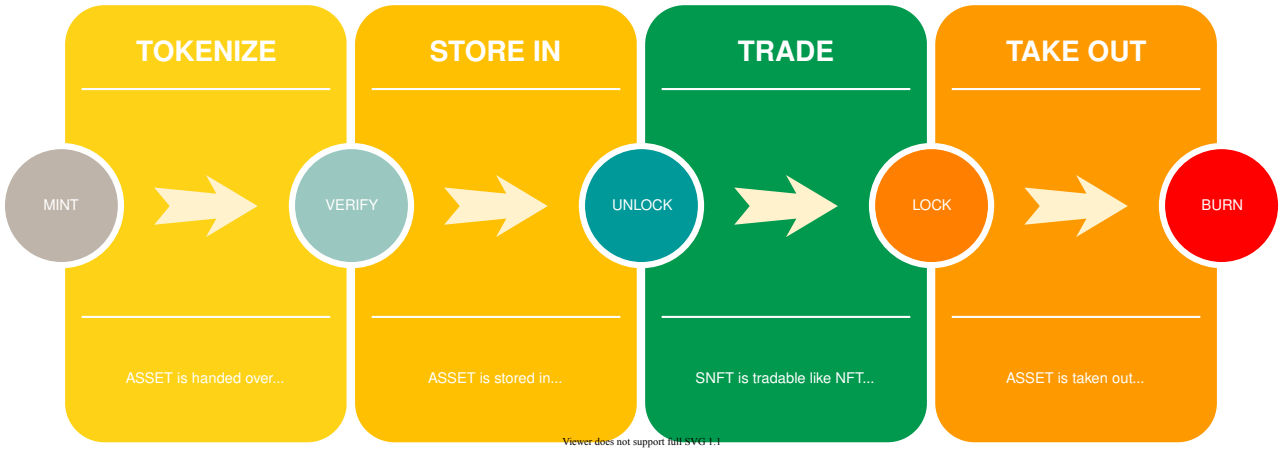
The owner can remove his work of art from the SNFT bonded warehouse at any time. He registers the removal via tool blockchain-signed.

This is in turn electronically acknowledged by the removal. A removal immediately leads to blocking of the token. It can now no longer be traded.

Locked contracts are burned after one month.

If the artwork is not removed from storage, it can be traded over the storage period. To trade, the owner and a potential buyer need an Ethereum wallet (e.g. MetaMask) and a decentralized exchange.

Although all activity and transactions are recorded and publicly viewable, purchases on decentralized exchanges remain anonymous. This allows for mini-auctions where art acquirers do not have to appear directly.



Picture 2: Lifecycle of a SNFT

Anonymity

While the seller is identified during tokenization, since the tokenizers usually represent commercially operating companies, the buyer remains anonymous. The buyer can resell the SNFT at any time. The purchase is carried out exclusively via blockchain, and proof in the event of possible collection of the work from the security warehouse is provided by signature verification of the wallet of the last token holder.

Differentiation from other token classes

Security- or Equity-Token

In terms of function, security tokens can best be compared with shares and bonds. For example, they promise the holder a share in future profits of the company circulating the tokens as well as interest payments. The SNFT, on the other hand, is a proof of ownership and promises neither interest nor profits. Whether the physical asset behind it increases in value after a longer holding period is not relevant here.

Thus, with a SNFT, there is also no repayment obligation, no liquidation is carried out, and thus no proceeds are generated in which the holder could participate. Furthermore, a SNFT cannot be terminated.

The ownership is not shared between several holders, so there are neither voting rights nor shares in the value of the asset.

Currency- or Payment-Token

Currency tokens have no intrinsic value, but are created through user trust, acceptance points, and market-capitalizing support in free trade against other tokens.

Each SNFT, on the other hand, represents its associated asset with corresponding value.

Utitlity- or Membership-Token

Utility tokens include a right of use for real economic services, the issuer allows the purchase of goods or services per token.

In the case of SNFT, the issuer is the seller itself. At the time of issuance, token holder and asset holder are indentical. The process of tokenizing is a service that can be contracted with a certified tokenizer with or without a subsequent intention to sell.

The initial purchaser of a SNFT recognizes through the SNFT registration and tokenizer certification that the can trust that token with the expectation of a collateralized stored asset.

The purchase itself can be realized on all NFT compatible marketplaces for which the token is approved. The purchase is not tied to the tokenizer, nor to the standardizer.

The purchase price is credited to the seller by the marketplaces minus a market commission (approx. 2-3% of the purchase price). After that, the seller no longer has access to the asset, he is no longer the owner.

While utility tokens securitize the purchase of a good (in the future), the SNFT serves as immanent proof of ownership.

Values

Trust

In the technology used, that it is transparent, forgery-proof, durable and stable. Trust in the physical system of settlement and deposit, without a doubt the token owner must always have access to his physical work of art, as well as this must be secured so that no one else has access.

Trade

Making art objects exchangeable - more specifically, the possibility of transferring ownership of an asset without a third-party institution, secured only by a cryptographic token. Connected to this is the transparent pricing. Connected with that the traceable performance.

Status

Status between owner and an asset per se - clear and 100% secure definition of the token owner's status as the owner of the physical thing and real customary ability to dispose of an asset.

Financing

At present, the standardization project is financed exclusively privately.

The Niclas Castello Foundation has taken over the financing of the storage.

Roadmap

02.02.2022	Definition of SNFT Standards (Draft)
02.03.2022	Prototyp contract for mapping assets on blockchain
12.04.2022	Establishment of a tokenizer company ARES
17.04.2022	Tokenizing of three Cubes of NCF in SNFT based NCF3 contract template
06/2022	Tokenizing of further assets in NCF4 contract template
10/2022	Establishment of a foundation

Further Discussion of Impacts on Markets

Some Markets Problem

The structures of the art market are considered by some observers to be highly centralized in spots, undemocratic and exclusive. The Corona crisis showed the extent to which the absence of agglomerated spots brought the market to a virtual standstill, while the shift of existing concepts to the medium of the Internet alone increased their reach.

Accordingly, the art market shows itself to be a highly inefficient market. Aliquidity, high transaction costs and operationally complex logistics clearly speak for this hypothesis.

With an annual sales volume of around $50 billion, the art market offers gigantic potential for achieving a social welfare gain through the development of an efficient market.

Engage the Art Market

Basically, the SNFT standard solves three fundamental problems of the art market.

- Transaction costs of >50%, due to the monopoly position of individual market players.
- Illiquidity due to closed organizations determining market access
- Payment processing today takes an average of 6 months and multiple parties.

It is expected that the use of SNFTs to process physical artwork sales will create an efficient art market for the first time.

- Transaction costs currently drop approximately 50% to less than 5%.
- Complete liquidity of the art asset through trading of SNFTs as ownership certificates.
- Real-time payments through decentralized settlement via exchanges or directly between wallets.

This will create an influx of millions of new investors into the art asset class. The art market will become more accessible and democratic.

„Transparency is a skill, part art, part science, that is built on assets, including people and knowledge. You don’t have to get it perfect to get it right, but you need to make a conscious effort to develop that skill.“

– Stephen Linaweaver