GARANASKA TOKENIZATION

About: Tokens

GARANASKA

Versatile tokenization capabilities to empower enterprises

Module based on the technology of: DGT

Native Decentralized Economy Coin ("DEC")

B2B2C and B2B2B models, open to developing applied white-label token solutions

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DGT NETWORK

A **TECHNOLOGY:** Open-source modular distributed ledger technology of a new generation, accessible to any organization (DGT.NETWORK)
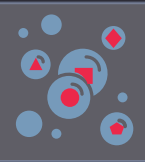
B **BUSINESS:** Enterprises operate nodes and form value-exchanging and data-managing ecosystems

C **MONETIZATION:** A decentralized open economy, cost-saving vertical integration, new channels through horizontal integration of enterprises

D **TOKENIZATION:** A unique tokenization system (GARANASKA) that allows enterprises to create new value through tokens (security, utility, asset-based, NFTs, commodity, credit)

E **NETWORK:** Hierarchal network with support for open API, ready for applied B2B2B and B2B2C cases in enterprise ecosystems, supply chains & trade retail, and decentralized finance (DeFi)

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Decentralized tokens are similar to subway tokens. They are bought with fiat funds and then exchanged for some right – riding a train, watching a movie, obtaining a good, participating in a lottery.

Introduction of tokens usually pursues the following objectives:

- Facilitate the exchange between money and an opportunity / service within a closed ecosystem. For example, subway tokens simplify control at turnstiles and reduce the number of required ticket offices at the entrances;

- Reduces the effect of inflationary mechanisms – the fare for tokens changes, but the passage through the turnstile can still equal to 1 token;

- Average consumer spending increases – it is psychologically easier for users to part with tokens than money;

- The ability to use arbitrary fractions of money, creating a "gamified" situation that allows for internal conversion without the high costs associated for supporting fiat mechanisms.

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WHAT IS TOKENIZATION

Modern technologies are increasingly working with virtual objects: digitized real objects and digital assets themselves (information, images, game objects)

A token is a digital asset or an independent object of value (recognized by a community). Physically, the token exists as an entry in a distributed ledger registry.


Tokenization — the process of transferring rights to an asset into a digital token using distributed ledger technology.

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A digital passport (unique digital code) is created for the asset. It can be transmitted over the Internet, serve to receive any tangible or intangible asset, perform an action (payment, add time, change legal status, ownership, etc.)

TOKENIZATION

TOKENS
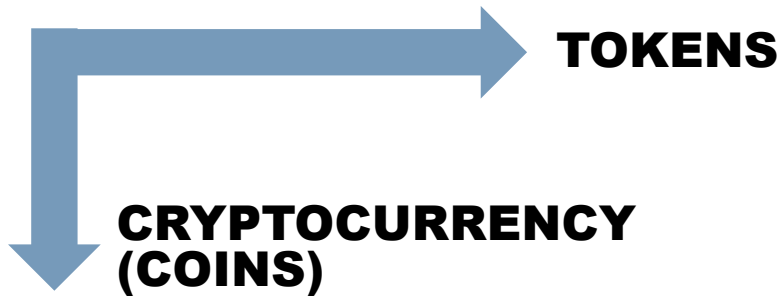
An entry in a distributed ledger designed to represent a unit of value or opportunity in an interaction (distribution, exchange, confirmation of rights) between participants in an information exchange within a particular computer system:

CRYPTOCURRENCY (COINS)
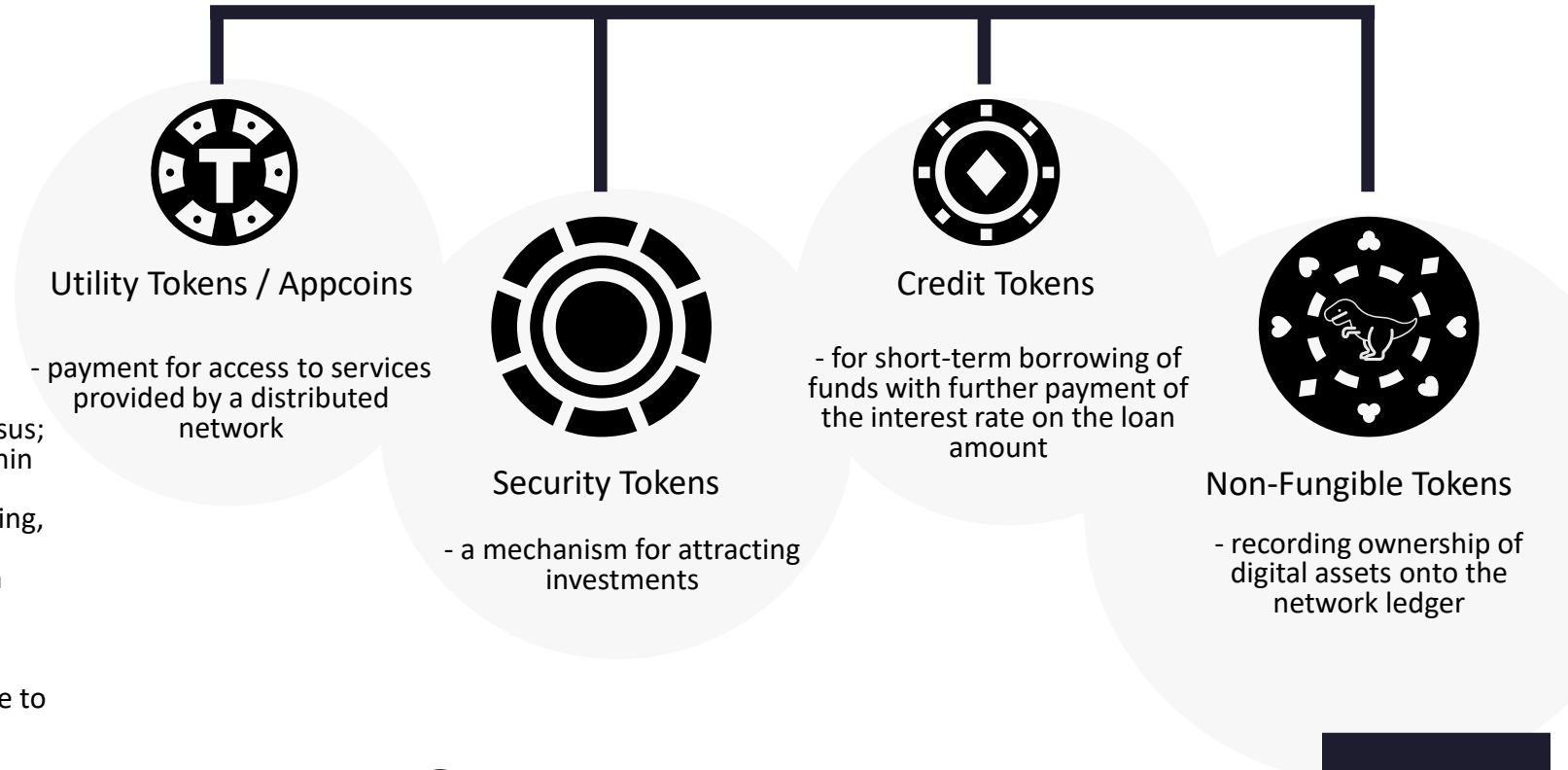
A digital asset is a means of exchanging goods or services for a single value equivalent, information about which is stored electronically in a specialized immutable database (distributed registry)

JAN LANSKY'S RULES:
- Does not require centralized management – supported by consensus;
- Cryptocurrency ownership is subject to decentralized tracking within a single distributed network (integrity is maintained);
- It is possible to create new units of cryptocurrency (emission, mining, or minting);
- The right to ownership of cryptocurrency units can only be proven cryptographically;
- The system allows you to carry out transactions in which the ownership of cryptographic units changes;
- If there are two different instructions are entered at the same time to change the ownership of the same cryptographic units, then the system does not execute more than one of them.

Utility Tokens / Appcoins

- payment for access to services provided by a distributed network

Security Tokens

- a mechanism for attracting investments

Credit Tokens

- for short-term borrowing of funds with further payment of the interest rate on the loan amount

Non-Fungible Tokens

- recording ownership of digital assets onto the network ledger

Crypto – tokens =

Digital records in a distributed ledger + rules for their issuance and exchange

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TOKENIZATION

HOW TOKEN SYSTEMS ARE BUILT

NIST

NISTIR 8301

Blockchain Networks: Token Design and Management Overview

	Blockchain-Native (Base Layer)	On Top of an Existing Blockchain (Smart Contract Layer)
UTXO-Based	System account balances are encoded as the sums of unspent transaction outputs of past transactions. Spending a token results in new, unspent transaction outputs. For example, bitcoin is Bitcoin protocol's native token.	A separate protocol, sometimes called *colored coin* method, encodes custom account balances or unique identifiers into extra metadata included in unspent transaction outputs of past transactions.
Account-Based	Variables in the blockchain's global state store system account balances assigned to blockchain addresses. For example, ether is Ethereum protocol's native token.	Variables in the blockchain's global state store custom account balances or unique identifiers assigned to blockchain addresses either centrally, within *token factory contracts*, or at the account level (i.e., data values and code are decoupled).

HYPERLEDGER
TOKEN FRAMEWORK
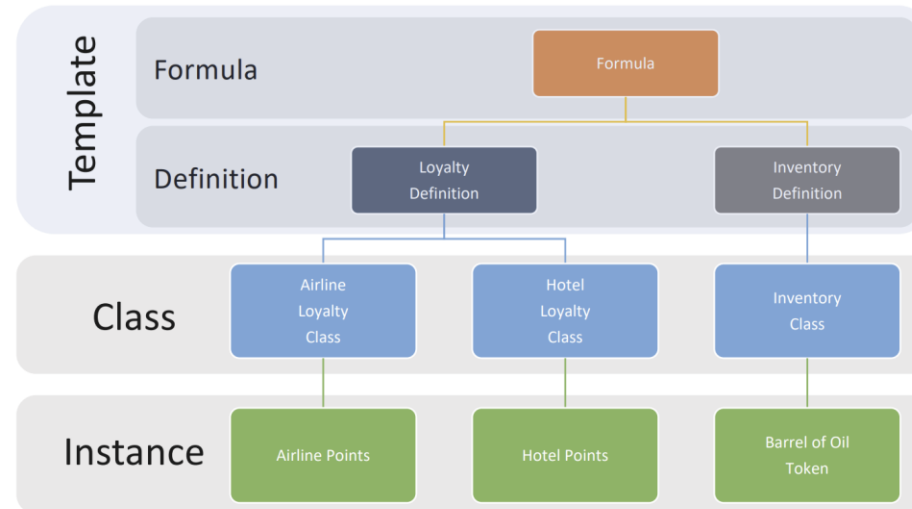
Internet Standards
(stateless data communication)
TCP/IP, HTTP, UDC, REST API

Content Standards
(data format)
File Formats, HTML/CSS, JSON

Blockchain Standards
(data storage & logic)
ISO/TC 307 (ISO 22739:20, ISO/TR 23244:2020), ERC20, ERC721, ERC1155, IBC
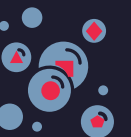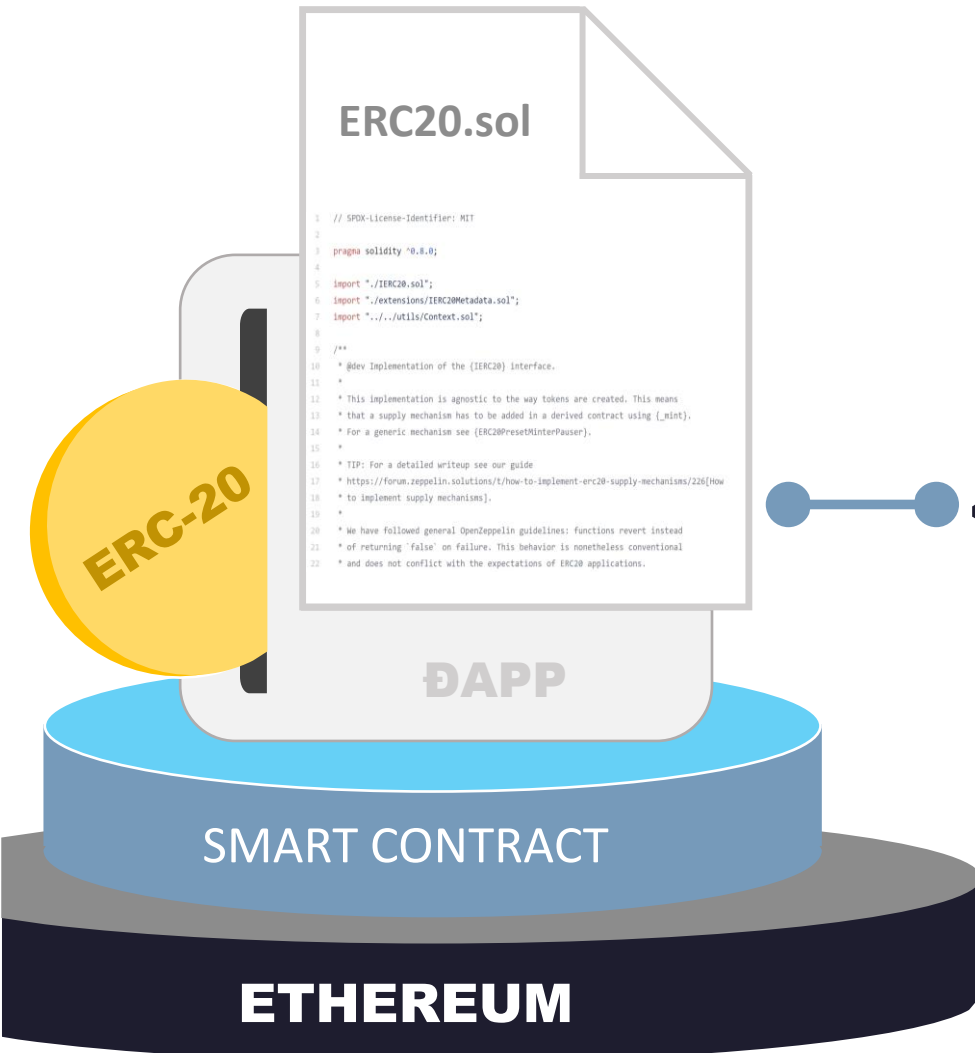
Ethereum token standards

Issuance of tokens (crypto tokens) – the creation of computer programs written according to specific standards that define standard methods for issuing and distributing tokens

Token systems are tied to the network on which they were emitted (distributed registry on which they are stored), as well as with certain standards against which the corresponding rules of emission and transfers are checked.

In Ethereum, tokens are represented by a smart-contract. So emission, transfer of tokens and other rules require the fulfillment of a smart-contract, which cannot be altered once it is live.

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ERC20.sol

```
1  // SPDX-License-Identifier: MIT
2
3  pragma solidity ^0.8.0;
4
5  import "./IERC20.sol";
6  import "./extensions/IERC20Metadata.sol";
7  import "../../utils/Context.sol";
8
9  /**
10  * @dev Implementation of the {IERC20} interface.
11  *
12  * This implementation is agnostic to the way tokens are created. This means
13  * that a supply mechanism has to be added in a derived contract using {_mint}.
14  * For a generic mechanism see {ERC20PresetMinterPauser}.
15  *
16  * TIP: For a detailed writeup see our guide
17  * https://forum.zeppelin.solutions/t/how-to-implement-erc20-supply-mechanisms/226[How
18  * to implement supply mechanisms].
19  *
20  * We have followed general OpenZeppelin guidelines: functions revert instead
21  * of returning `false` on failure. This behavior is nonetheless conventional
22  * and does not conflict with the expectations of ERC20 applications.
```

ÐAPP

ERC-20

SMART CONTRACT

ETHEREUM

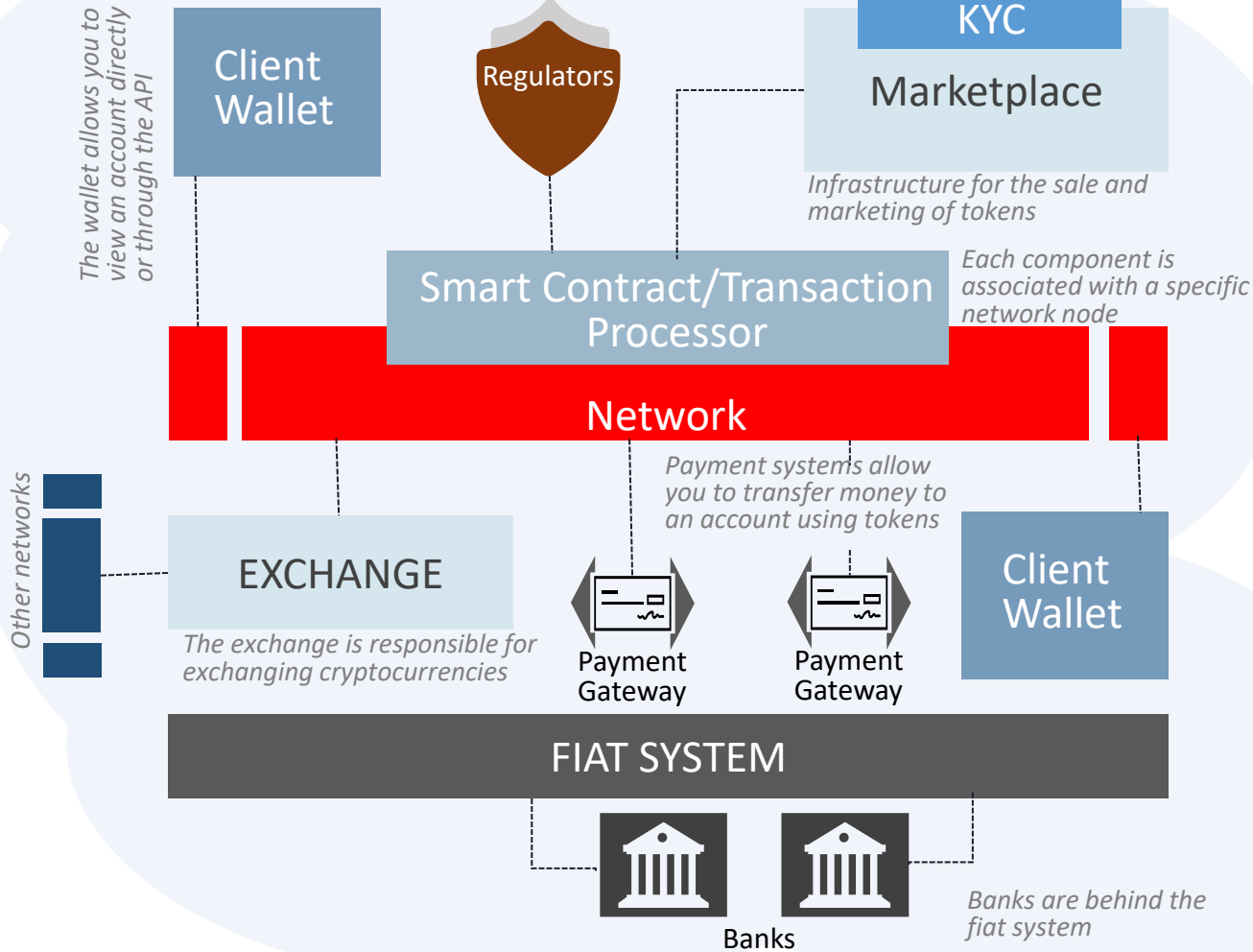| #	FUNCTION	ARGUMENTS	RETURNS	EXPLANATION
1	Name	-	String	Token name
2	Symbol	-	String	Token symbol
3	Decimals	-	Unit8	Fractional part of the token (by how much to divide in 10^3)
4	totalSupply	-	Unit256	Total token supply
5	balanceOf	address_owner	Unit256	Token balance of the smart-contract owner
6	Transfer	address_to, _value	Bool	Movement of tokens from the owner's address to an address of another user
7	transferFrom	address_from, address_to, _value	Bool	Transfer of tokens from one address to another
8	Approve	address_spender, _value	Bool	Delegation of ability to manipulate tokens (ex. on an exchange)
9	allowans	address_owner, address_spender	Unit256	Amount of tokens allowed for manipulation by a delegate (exchange)

Tokens issued on Ethereum according to the ERC-20 standard contain a set of methods (such non-mandatory ones as whitelists and blacklists, time limits, etc.).
Placement and method calls are done from the wallet and some of these actions require gas (ETH) and some are performed for free.
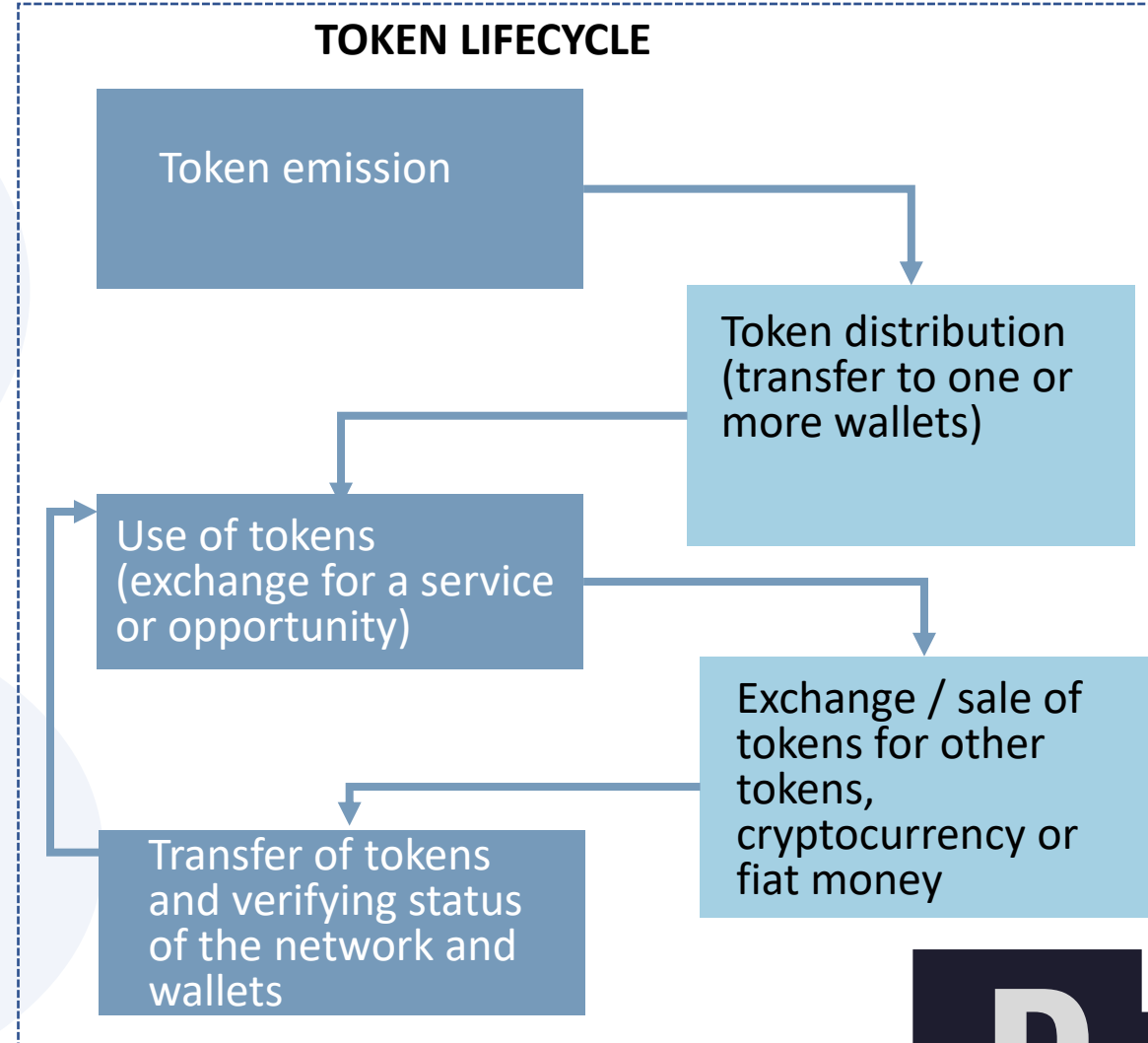
TOKEN LIFECYCLE

Regulators have special requirements for organizations emitting smart-contracts

Client Wallet

Regulators

KYC

Marketplace

Infrastructure for the sale and marketing of tokens

The wallet allows you to view an account directly or through the API

Smart Contract/Transaction Processor

Each component is associated with a specific network node

Network

Other networks

Payment systems allow you to transfer money to an account using tokens

EXCHANGE

Payment Gateway

Payment Gateway

Client Wallet

The exchange is responsible for exchanging cryptocurrencies

FIAT SYSTEM

Banks

Banks are behind the fiat system

Token emission

Token distribution (transfer to one or more wallets)

Use of tokens (exchange for a service or opportunity)

Exchange / sale of tokens for other tokens, cryptocurrency or fiat money

Transfer of tokens and verifying status of the network and wallets

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Token management infrastructure encompasses several proprietary and external systems, which allow to create, promote and sell tokens. This includes the **software module / smart-contract** that controls the release and distribution of tokens in the network (rules), a wallet – a means of control and monitoring, a means of selling and exchanging for other tokens and currencies (marketplace, exchange)

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FEATURE	ERC-20	ERC-1400	ERC- 1155	ERC-777	ERC-721 [NFT]
Proposal	Standard ICO token – basic transfer functionality	Full or partial ownership of an object, additional methods for "owning" securities	Multi-token, the main idea of which is to save gas by supporting callbacks as event replacements	Fungible tokens, expand on the ERC-20 through more complex interactions (callbacks – hooks, rejecting token acceptance, redirecting received tokens to other addresses)	Non-fungible tokens (NFT) allow for storage of metadata, contain a link to digital objects outside the network (in IPFS, for example), and contain access protocol
Immutable Cap Table	✓	✓	✓	✓	✓
Open-Source Codebase	✓	✓	✓	✓	✓
Controller Access (Token Recovery Process)	✗	✓	✗	✓	✓
Compliance	✗	✓	✗	✗	✗
Issue / Redemption	✗	✓	✗	✗	✓
Permission Management W/ Multiple Agents	✗	✓	✓	✓	✓
Event Management	✗	✓	✓	✓	✗
Partially/ Non-Fungible	✗	✓	✗	✗	✓
MORE INFO	link	link	link	link	Link

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Non Fungible Tokens Create a Hot New Market for Digital Art

by Thomas Frey | Mar 18, 2021 | Business Trends

PCMAG.COM

WTF Is an NFT? The Latest Cryptocurrency Craze Explained

A non-fungible token (NFT) is a digital certificate for intellectual property stored on the blockchain. And Nyan Cat, Grimes, and Kings of Leon are all involved. Let us explain.

March 5, 2021

Forbes

Feb 28, 2021, 07:12am EST | 14,284 views

Non-Fungible Tokens 101: A Primer On NFTs For Brands And Business Professionals

Moneyweb

A look at NFTs, or non-fungible tokens

'I don't think too many people in the traditional financial world are losing sleep because I think they're fairly dismissive of the technology because they don't understand what's about to happen to them': Simon Dingle – founder and CEO, Inves Capital.

By **Simon Brown**   9 Mar 2021 ⊙ 09:29

Bloomberg

Crypto Entrepreneurs Plan London IPO for NFT Investment Firm

By Swetha Gopinath
April 1, 2021, 2:40 PM GMT+3

Nasdaq
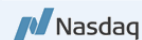
What Are NFT Stocks? Your Guide To Non-Fungible Tokens

CONTRIBUTOR
Amos C — StockMarket.com

PUBLISHED
MAR 27, 2021 3:24PM EDT

INSIDER
We talked to crypto-art investors to figure out what's driving people to spend millions on NFTs, despite no guarantee their value will increase
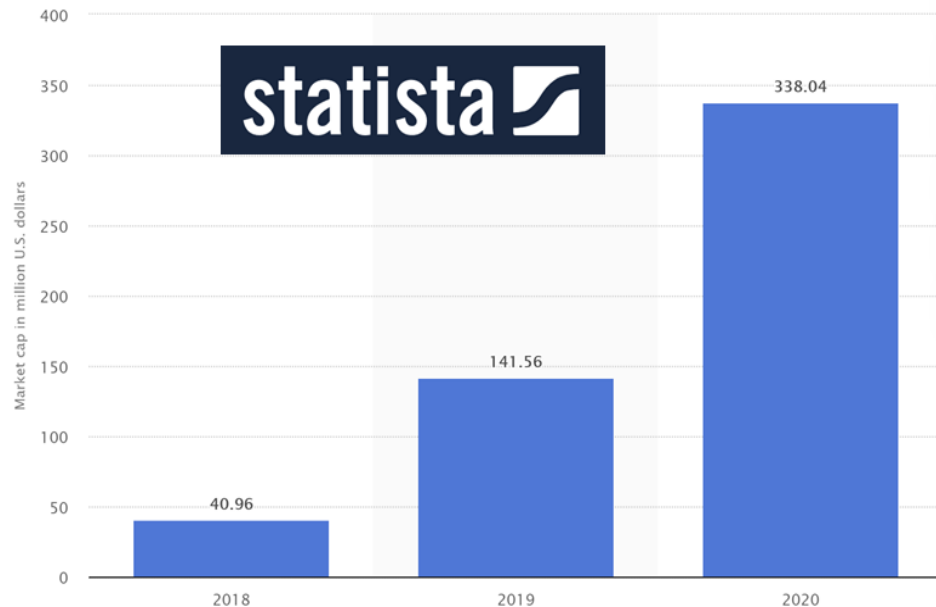
Grace Kay Mar 20, 2021, 2:15 PM

BBC
What are NFTs and why are some worth millions?

⊙ 12 March

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NFT TOKENS

The NFT market is receiving large investments from companies, funds, exchanges and traditional venture capital firms from both the crypto and "traditional" tech sector:

Opensea raised $23 million in a round led by Andreessen Horowitz, demonstrating a large VC firm's confidence in the long-term trajectory of the NFT market

Blind Boxes - an NFT platform based on the Binance Smart Chain has recently finished its strategic sale followed by a public launch and a valuation of $590 millions with days of the launch

Market cap in million U.S. dollars — statista
- 2018: 40.96
- 2019: 141.56
- 2020: 338.04

- According to the new NonFungible and L'Atelier Report, NFT transactions have tripled last year.
- The total worth of the NFT market is now 250 million dollars.
- Virtual worlds are the most popular segment, occupying 25% of the market; but art is catching up and sales have risen by 2800% in 2020.

Tokenization of Assets

Decentralized Finance (DeFi)

Volume 1
Spot on: Fundraising & StableCoins in Switzerland

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The NFT market is gaining momentum. Although there are skeptical voices saying it is a bubble, the representation of a digital asset in form of a blockchain record is a long-term trend.

EY
Building a better working world

DGT

The DEC cryptocurrency is the native token of DGT Network. It is issued in a one-time emission and distributed to network node participants through "minting".

Digital Economy Coin

DEC COIN is a **cryptocurrency** (type of digital currency), the internal unit of account on the network, which provides a decentralized payment system that works in a fully automatic mode.

Ð has the following capabilities:

- Ð cryptocurrency: a fully decentralized currency emitted once by the DGT Network in a limited amount and placed on a special account;
- Further distribution of Ð is defined by rules connected with the life of the node, the number of transactions processed, or fiat money deposited to purchase the coins;
- Ð is used for mutual settlements between individual ecosystems, exchanging / emitting internal (secondary_ tokens, exchanging with external ETH / BTC systems;
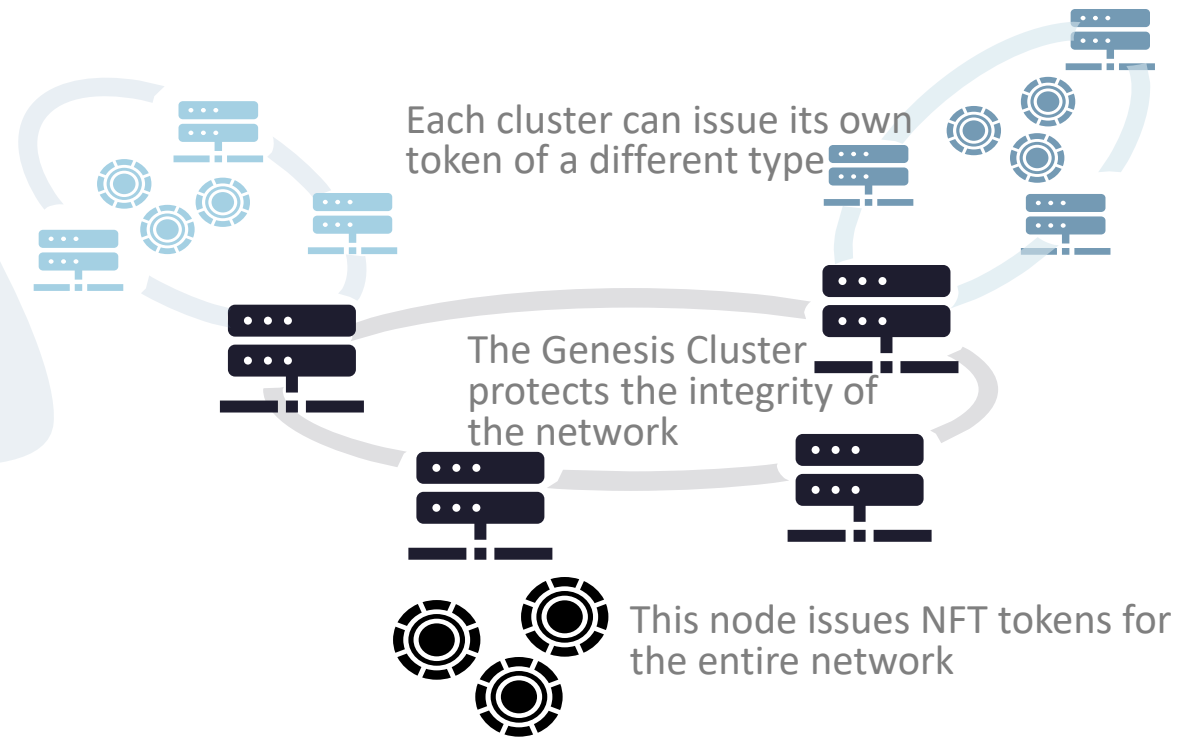- The initial price of Ð is set by a forecast model of DGT Network, but the rate is not fixed

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TOKENIZATION

While Đ is determined by the rules of the network, business users may issue different types of secondary tokens (app tokens for payments and mutual settlements, securities, commodity tokens, NFT tokens representing unique digital objects)

- To issue a white-label token, a business must have a node signed up to the network that reserved a certain amount of DEC, corresponding to the number of tokens to be issued;

- Tokens are tied to a family of transactions that is held in common by the entire network – this allows them to me visible by any wallet, as well as exchanged between each other through atomic swap;

- For reserved tokens, an anchor in the Ethereum network (in the form of a smart contract) is made, which corresponds to the internal token via DGT

Each cluster can issue its own token of a different type

The Genesis Cluster protects the integrity of the network

This node issues NFT tokens for the entire network

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CONNECT TO DGT NETWORK

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twitter.com/DGTNetwork

youtube.com/channel/UCjEZ7nFc1TWOIywkZlOff8A