



Fungible Tokens

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- Examples



Fungible Tokens - Introduction

- A token is a currency or digital asset in a limited environment on top of the blockchain
- 'Fungible' means that each token is equivalent to any other token
 - Just like a fiat (USD) or crypto currency (Ether)
- Doesn't replace the original cryptocurrency like Ether
- Similar to tokens used in gaming arcades or share certificates in a company
- Why create a token when Ether already exists?
 - Useful for defining and exchanging value within a closed system
 - Inherently holds no value (unlike USD or Bitcoin) so can be mapped to various use cases
 - Can be controlled by the creating entity for various purposes
- Based on smart contracts - Code necessary to control supply, transfer, store balance, etc.
- Underlying transactions still happening on the blockchain
- Continue to require Ether (or equivalent) for gas fees

Fungible Tokens - Use Cases

- Types
 - Utility - Currency to be spent in a specific environment like an online game or a company's products
 - Security - Define ownership of another asset, or of shares in a company or product
- Crowdfunding (Initial Coin Offering - ICO)
 - Equivalent to an IPO or a crowdfunding platform like Kickstarter, based on the stage and type
 - Tokens bought in exchange for the underlying cryptocurrency (Ether) or a government currency (USD)
 - Can be of either type
 - Utility - Token can be used to buy company's services or products, once available, usually at a discount
 - Security - Profit sharing, ownership (STO - shares), voting rights (DAO)
- Online platform currency
 - Entertainment - Internal currency of digital multiplayer games, digital casino, points on social sites
 - Utility - Value store and currency in dapps - Royalty based music service, storage/backup service, freelance platform economy
- Equivalent to physical assets
 - Represent ownership of physical assets like gold or commodities - similar to offline commodity funds

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Fungible Tokens - Considerations

- Tokens implemented using a set of smart contracts
- Pre-defined logic to control overall supply, internal transactions, exchange with other currencies or services
- Anyone can write and deploy their token system
- Writing smart contracts is hard - especially for such a big use case
- Multiple standard specifications proposed and implemented to facilitate token management
- On Ethereum -> ERC-20 (Most popular), ERC-223, ERC-777
- Standards also allow popular wallets to implement and allow management of multiple tokens for normal users

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Fungible Tokens - ERC-20

- Initiated by Vitalik Buterin, detailed proposal by Fabian Vogelsteller in 2015
- Supports
 - Direct transfer - Normal transactions, buying, selling
 - Pre-approval to allow later expense by a third party - Escrow, subscriptions, auto-deduction based on task completion or delivery
- Contract API - Main functions:
 - *totalSupply* - Returns the total tokens in the whole system
 - *balanceOf(address _owner)* - Returns the balance of any account, given the **_owner** address
 - *transfer(address _to, uint256 _value)* - Transfers **_value** to **_to**, from the current account
 - *approve(address _spender, uint256 _value)* - Allows **_spender** to transfer upto total **_value** from the current account to anyone else, in multiple transactions
 - *transferFrom(address _from, address _to, uint256 _value)* - Allows a pre-approved sender to send **_value** from **_from** to **_to**
 - *name* - Returns name of the token
 - *symbol* - Returns symbol of the token



Fungible Tokens - Scale (on Ethereum)

- 400,000+ different tokens
- ~600 tokens with USD 1 million+ market cap
- Combined market cap of just the top 10 tokens is USD 100+ billion
- ~300,000 daily active ERC-20 addresses
- Just Tether (number one token by market cap) has 10% of all Ethereum transactions

Fungible Tokens - Examples

- Tether - Pegged at \$1, USD ~30 billion market cap, digital equivalent of cash currency
- Binance BNB - ~\$300, USD ~5 billion market cap, utility token for various goods/services
- USD Coin - Pegged at \$1, USD ~25 billion market cap, 'Stablecoin' used in various financial services like payments, lending, trading, investing, etc.
- HEX - ~\$0.01, USD ~50 billion market cap, Certificates of Deposit (CD) - interest generation based on investments like a fund
- Uniswap - ~\$20, USD ~20 billion market cap, a cryptocurrency and token exchange with this token as the internal currency
- Chainlink - ~\$20, USD ~20 billion market cap, largest provider of oracles, internal currency for usage payment
- Theta - ~\$6, USD ~6.5 billion market cap, video delivery using participating nodes who get paid in the token



Fungible Tokens - ICO Examples

- NEO - Smart contract-driven blockchain platform based in China
- Ethereum - Ethereum itself launched with an ICO
- NXT - Fintech focused blockchain platform
- Filecoin, Storj - Cloud storage with users participating as nodes for storage
- Bancor - Cryptocurrency trading exchange
- Sirin Labs - Security and privacy focused smartphones
- Brave BAT - Web browser with reward for advertising views



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