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Disruptive Technology

# How to choose the right blockchain for NFTs?



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## Authors

We would like to thank everyone who has supported this research journey and the production of our 2nd report on NFTs. As research analysts in this fast-growing NFT space, we aim to help readers learn about the innovative opportunities enabled by this disruptive technology.

We hope this report will be a trusted, non-technical guide as you explore blockchains for your NFTs.



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### Disclaimer

This report was produced strictly for educational purposes only and not to be used as financial advice as the contents of this report reflect the personal views and opinions of the authors. twimbit will not be liable for damages pertaining to the accuracy of the report.

Since NFTs are generally correlated to cryptocurrencies, the authors have kept all references to publiclyavailable data dated before the May 2022 market incident to provide a fair market view.



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# Chapter 1 | The role of blockchains

## Layer-1 blockchains form the foundation of NFT ecosystems

### The NFT Ecosystem Stack\*



#### How are blockchains and NFTs related?

- An NFT is created through the "minting" process, which involves signing a blockchain transaction that encompasses details (i.e. token ID, metadata, owner) of the digital token.
- The entry is then broadcasted throughout the blockchain, upon which is validated, will trigger a smart contract function that will create a unique token to be assigned to its owner/creator.
- Historically, a majority of NFTs were minted on layer-1 blockchains like Ethereum but rising gas fees have prompted many creators and projects to use layer 2s, which are cheaper and faster.
- Immutable transactions on the blockchain allow permanent ownership of digital assets in the form of NFTs, which can then be transferred, sold and bought on different blockchain platforms.

#### Here's a quick reminder:



**Blockchains** securely record and store transaction information in a database distributed across a network of computers.



**Non-fungible tokens (NFTs)** are digital contracts stored on the blockchain that can be uniquely identified and non-interchangeable.

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## A simple breakdown of the blockchain layers



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## How do transactions on the blockchain work?

Below is a general overview of the transaction flow and blockchain node interaction in a Proof-of-Work blockchain.



While the execution process differs slightly in other types of blockchains, the key difference is related to the consensus mechanism. For example, Proof-of-Stake blockchains do not impose competition to mine the next valid block but select block validators based on the amount of token that has been staked in the network.

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## Chapter 2 | Properties of NFT blockchains



## DYOR areas before choosing a blockchain for NFTs

#### Consensus Mechanism

Protocol algorithms used to verify transactions and maintain security

Proof-of-Work & Proof-of-Stake

#### Marketplaces/Minting

Platforms where NFTs can be stored, displayed, traded and minted

OpenSea, Rarible, Atomic Market

#### **Transaction Cost**

Fee paid by users to execute various types of blockchain transactions

Fixed vs Demand & Supply-Based

#### Smart Contract

Self-executing codes that enable NFT creation, ownership and transfer

Digital Vending Machines

#### DApp Ecosystem

Development of applications that enhance NFT use cases

Fractionalisation, Gaming, De-Fi

#### Programming Language

Frontend & backend code used in blockchain development

C++, JavaScript, Simplicity, Solidity

#### **Token Standard**

Set of rules for creating, issuing and deploying new tokens

ERC-721, BEP-20, FA2, NEP10

#### Transaction Speed

Measured in transactions per second (TPS) and block confirmation

Bitcoin can process 5 to 7 TPS

#### Native Token

Cryptocurrency used to pay for performing different functions

\$ETH, \$BAKE, \$XTZ, \$SOL, \$FLOW

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## Source: twimbit \*non-exhaustive list of important blockchain features

## Understanding the scalability trilemma in blockchains

#### Decentralisation



### What is the scalability trilemma?

Evolved from the CAP theorem, it is the belief that public blockchains will struggle to find a balance between three key elements and must sacrifice either decentralisation, scalability or security.



**Decentralisation** refers to the degree to which network control is democratized and no single entity or party possesses majority governing power



**Scalability** is related to the potential of a network's capacity to grow and cater to higher usage, without compromising performance and throughput



**Security** is the defensibility of a network against hacks and threats (i.e. 51% attacks) that aim to manipulate transactions and cause outages.



## **Chapter 3** | Examples of blockchains for NFTs



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# Studying blockchains that support smart contracts using the scalability trilemma



Source: twimbit analysis, technical whitepapers on GitHub, CoinMetrics, Consensys, blockchain explorers Relative scores out of 5; Ethereum is considered a PoW blockchain and is compared to Bitcoin

# Ethereum is the leading blockchain for the NFT ecosystem while long standing issues of environmental sustainability



#### Understanding the blockchain Ethereum is an open blockchain platform released in 2015 that allows developers Top NFT marketplaces / minting services: to build DApps that run on Ether (\$ETH) and are executed by the EVM. Ethereum introduced a built-in Turing-complete programming language known as **OpenSea** Solidity (Object-Oriented) that enables programmable smart contracts for NFTs. Tracking, management and storage of NFTs is done through the ERC-721 & ERC-**R**arible 1155 token standard that cryptographically identifies these unique digital tokens. gem Two types of accounts: externally owned accounts (EOA) & contract-owned. **Key blockchain metrics** US\$ 15 15 to 30 PoW 5.784 1.2 petahashes Peak Hash Rate/s Transactions/s Average transaction fee\* Consensus mechanism Average Node count Notable NFT projects Strengths vs Weaknesses 1. Established ecosystem 1. Expensive gas fees 2. Flexibility of smart contracts 2. Heavy energy requirement Adidas 1 3. Robust network architecture 3. High risk of network upgrades

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Source: twimbit, CoinTelegraph, DappRadar, web3.university, cryptoeq, messari.io \*as of Q12022; fees varies significantly according to network usage (~US\$3,283/ETH)

## Solana is a cheap and fast blockchain for NFTs but is prone to network shutdowns caused by transaction spikes



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Source: twimbit, CoinTelegraph, DappRadar, solanabeach.io, Blockworks, DefiSafety \*scalable up to 100,000 TPS, \*\*snapshot as of 20 June 2022

# Branded the "King of NFTs", Wax lives up to its name as a purpose-built blockchain for many enterprise NFT projects



Source: twimbit, CoinTelegraph, DappRadar, Moralis.io, wdny.io

\*scalable up to 8,000 TPS; \*\*network fees of 2% for secondary NFT transactions; \*\*voted by stakers, on top on 35 standby guilds

## Being a hard fork of Go Ethereum, BSC enables efficient transactions through a centralised consensus mechanism













BSC is also compatible with EVM and thus, developers can easily migrate smart contracts written in Solidity and Vyper to Ethereum while enjoying better tooling. with faster finality and lower fees.



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50 to 70 Transactions/s*	US\$ 0.01 Average transaction fee	PoS-A Consensus mechanism	Max No	21 de count**	~11% % of supply staked	
Notable NFT projects		Strengths vs Weaknesses				
Mobox	PancakeSwap Squad	Broad interoperable ecosyst 2. Low transaction fees 3. Scalable and reliable netwo	tem ork	<ol> <li>Centralised network structure</li> <li>Deflationary tokenomics</li> <li>Lack mainstream NFT adoption</li> </ol>		

Kev blockchain metrics



## Created as an Ethereum alternative, Flow features a multirole node architecture that boosts network speeds



Source: twimbit, flowscan.org, CoinMarketCap, thebalance, Flowverse, pixelplex.io, messari.io, LimeChain \*ongoing plans to introduce a variable fee structure rather than a flat fee of 0.00001 FLOW/transaction; \*\*new node operators must apply and obtain approval

# Enterprise-grade NFT solutions are rising on Tezos as it promotes the use of clean and gas-optimised transactions











Understanding the blockchain								
•	Top NFT marketplaces / minting services: <b>objkt</b> <b>fx(hash)</b> Kalamint							
Key blockchain metrics								
	Up to 40 Transactions/s*	US\$ 0.01 Average transaction fee*	L-PoS Consensus mechanism	~382 Average Node cou	~75% unt % of supply staked			
Notable NFT projects		T projects	Strengths vs Weaknesses					
	NFL All Day	UFC Strike G D V	<ul> <li>Low gas fees and carbon i</li> <li>Self-amending protocol</li> <li>Fast transaction processin</li> </ul>	impact 1. Cei 2. We 3. Lao ma	ntrally structured network eak staking governance ck developer ecosystem turity			





# Chapter 4 | A checklist for enterprises

# Corporations will progressively explore the vast potential of NFT use cases and business applications

Three categories of how NFTs can drive value for businesses in the long-term



Companies are just starting to scratch the surface of the opportunities in NFTs. In time, NFTs will eventually reach technological breakthroughs that will enable the mainstream recognition and adoption of **unique digital assets**.

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In order to achieve success with NFT adoption strategies, enterprises must carefully evaluate the opportunity ...

Four-steps on how enterprises should assess NFT adoption into their business



#### Possibilities for companies that capitalise and leverage NFTs as a technological revolution

- 1. Authenticate and provide immutable evidence for various commercial transactions between physical and digital realms.
- 2. Provide democratised fractional ownership of digital goods (i.e. new monetisation model for art, music, IP, photography and research).
- 3. Create and sell digital items and collectibles that can be integrated into customisable fan avatars for gaming, events and metaverses (i.e. land, sneakers, fashion accessories, in-game features).
- 4. Create unique user engagement by personalising and monetising digital brand experiences with exclusive and tiered utility services for new and existing customers.
- 5. Offer transparent supply chain and reliable cross-stakeholder data to create new forms of security and customer trust.
- 6. Develop "digital wallets" that store user licenses and rights (i.e. product warranty, event ticket, access pass and redeemable vouchers).



# ... and select the right distributed blockchain networks to support new commercial breakthroughs

Addressing technological issues is one of the most straightforward, yet cumbersome elements of incorporating NFTs into a business strategy.

Below are several considerations on how to select a compatible blockchain:

### **Primary Considerations**

Includes key blockchain factors that will directly affect the fulfilment of current NFT priorities.

- ✓ Transaction speed & throughput
- ✓ Storage & execution cost structure
- ✓ Consensus & governance
- ✓ Smart contract reliability
- ✓ Robustness of chain security
- ✓ NFT ecosystem maturity
- ✓ Possibility of forking
- ✓ Energy efficiency
- ✓ Permissionlessness
- ✓ Use-case support

### **Ancillary Considerations**

Includes secondary areas that have less considerable impacts on deploying the NFT strategy.

- ✓ Developer friendliness
- Marketplace & DApp development
- Bridging & interoperability
- Native tokenomics (demand vs supply)
- ✓ Track record of founding team
- Roadmap & future plans
- Market capitalisation (TVL)
- Protocol longevity & history





## That's it, congratulations! Your understanding of NFT blockchains has now evolved.

The purpose of this report was to introduce readers to the blockchains that enable the vast potential of NFTs and was never meant to be an exhaustive piece. With that said, we have put together a list of additional materials (by chapters) that we found useful in our research to guide readers who are in search of more information.

We are also going to publish supplementary articles that expand on the topics covered in this report. This will help us speak our minds better and provide readers with deeper insights.

Click on this <u>link</u> to access a Notion document with a comprehensive list of resources (that will continuously be updated with suggestions).





## Help us, help you!

Thanks for giving this report a read. As much as we want to start designing our next piece, we sincerely ask for your feedback and suggestions. This will help us better understand what matters to you. We will carefully consider your inputs in the our upcoming NFT series reports.



Scan this QR code to submit your feedback, anonymously. You can also click on this <u>link.</u>





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How can we help? reachus@twimbit.com