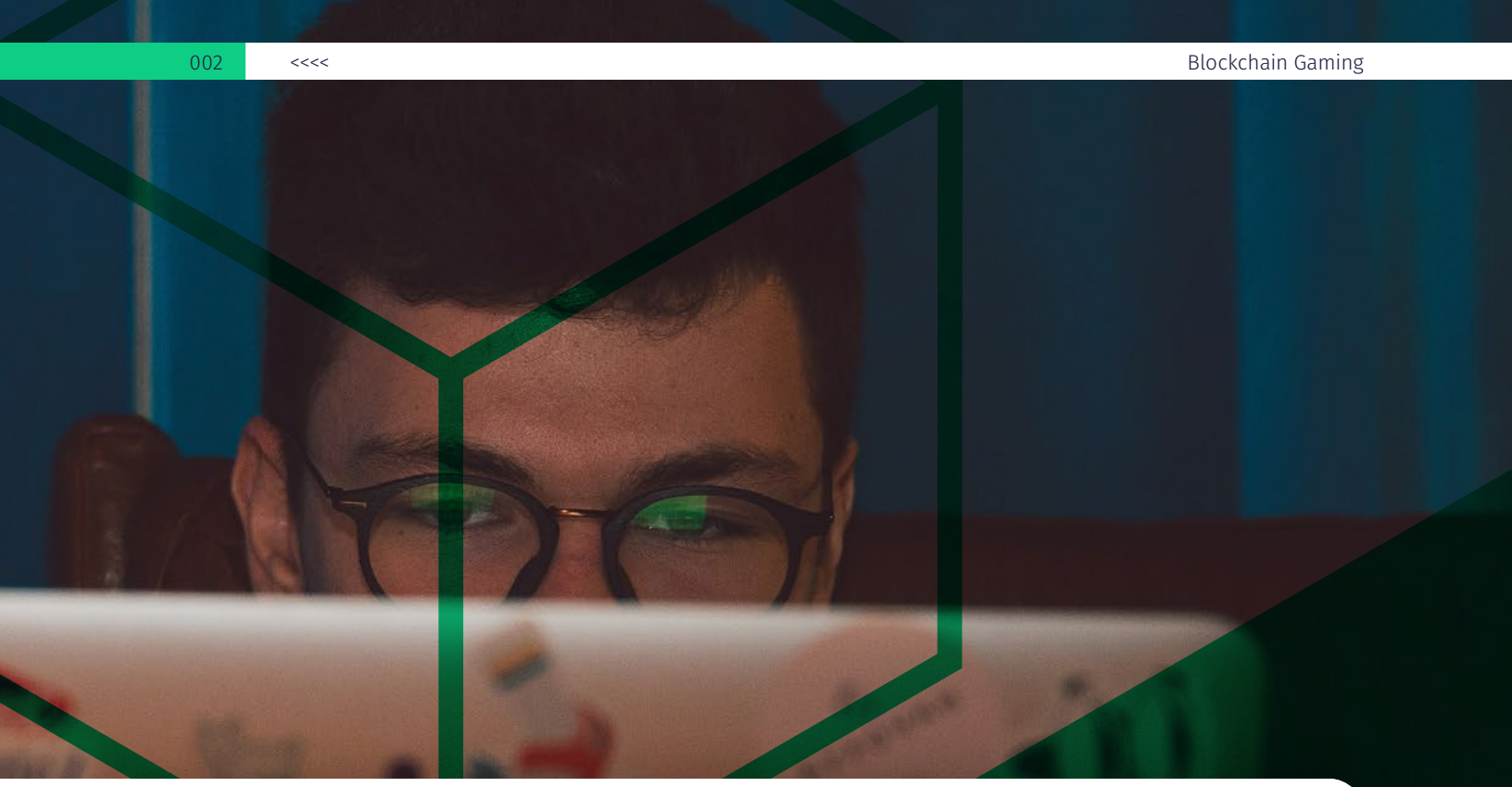
McClure Innovation Fund

CRYPTOEQ

Blockchain Gaming

CryptoEQ CORE+ Series

A deeper dive into the trends and topics in the news today.



Crypto is complex.
We make it simple.

CRYPTOEQ

Welcome to CORE+ Reports

At CryptoEQ, we decrease the learning curve to make crypto and blockchain simple. Our CORE+ Reports are the latest iteration that help newcomers and established crypto enthusiasts get a fresh take on the latest trends in the market.

With articles and exhibitions that focus on newest topics, CORE+ will help distill the different ways that blockchain can change the way we think about everything from finance, sporting events, supply chain optimization, and even gaming. You've probably heard of NFTs in the news recently, but even less monetized outlets have seen rapid innovation from enabling and integrating blockchain technology.

As we delve into these complex and multi-modal topics, we hope you will gain a better understanding of the potential that blockchain has to truly transform technology—and the world around us—as we know it.

CORE+ Reports:
Blockchain Gaming

I. Introduction to Blockchain Gaming 05

II. Flow 08

III. Polygon 10

IV. Ronin 12

V. Ethereum L2 Scaling Solutions 14

VI. Rollups 15

VII. Immutable X 17

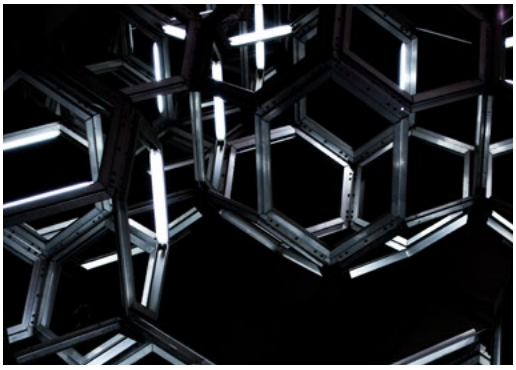
L2 is able to leverage Ethereum‘s financial infrastructure, network effects, and *security.*

Introduction to Blockchain Gaming

Due to their high transaction volume and need for speed, NFTs and more specifically, gaming, have pushed the blockchain world to new limits. Because blockchains typically optimize for security and decentralization, creating a global game on a blockchain comes with many hurdles, chief among them, scalability. In order to tackle this problem, creators have typically gone down three paths: more performant yet less decentralized application-specific layer 1 blockchains, sidechains, and layer 2s.

Layer 1s, while slower, allow developers to work within an existing development environment with a community of potential users already baked in. Sidechains are typically very fast, cheap, and tap into a layer 1s existing network effects and users but have vastly different security assurances and risks involved. Compared to the layer 1, sidechains are more difficult to maintain the network consensus and are most vulnerable via their "bridge" to the mainchain. Layer 2 solutions (L2) are primarily built atop Ethereum to enhance the networks scalability. They are able to fully leverage Ethereum's financial infrastructure, network effects, and most importantly, *security*!

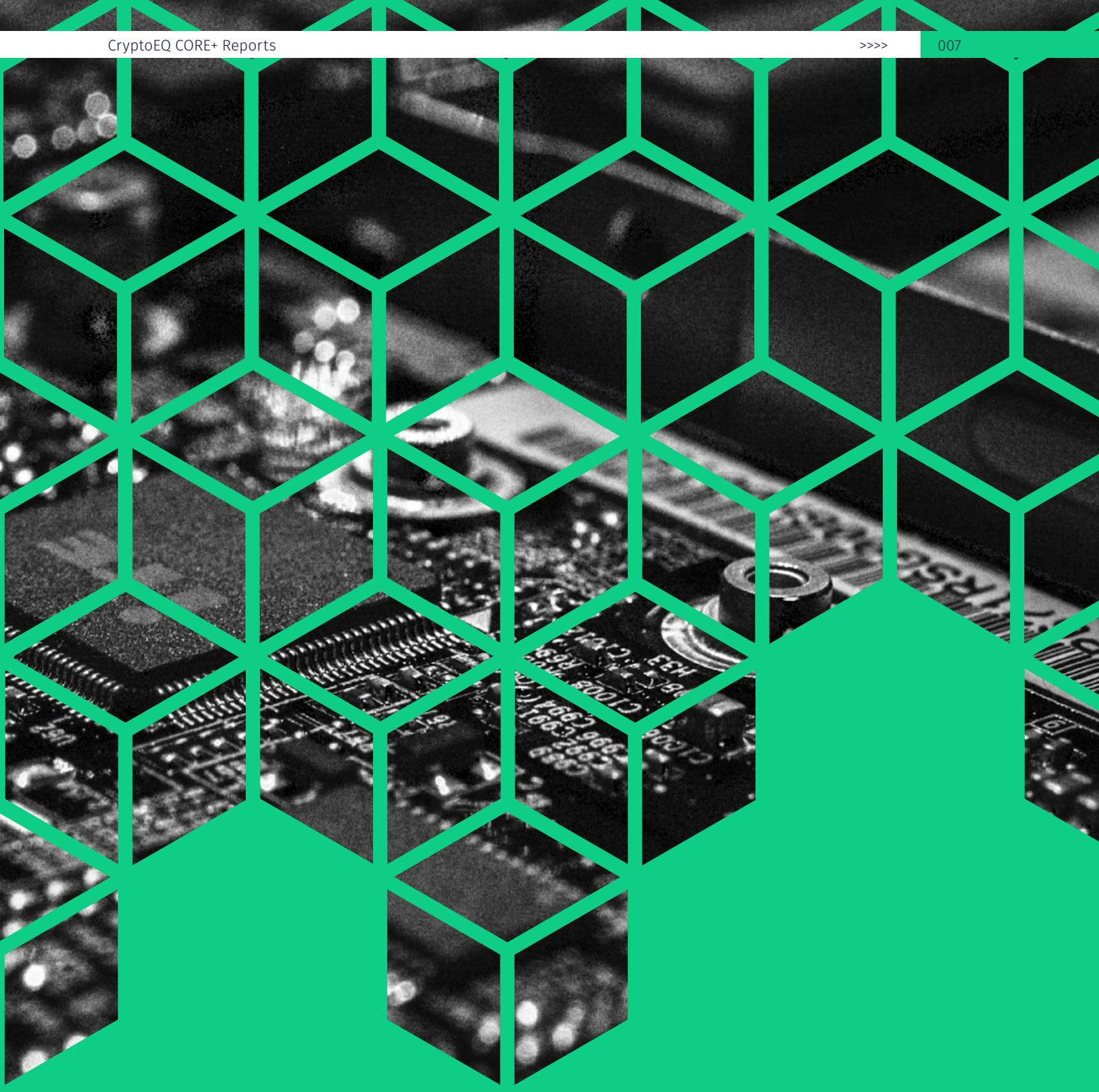
Users should consider if the project has a token.



Unfortunately, L2s are quite new and immature. Additionally, there are different approaches to Layer 2 solutions (e.g. ZK-rollup, Optimistic Rollup, etc.) with their own nuances.

Below, we cover some of the top examples from each blockchain gaming approach and discuss its pros and cons. While this analysis is not meant to be comprehensive, it should provide a high-level overview of the tradeoffs involved with each approach. Users should also consider if the project has a token, the development team and tools behind the project, other use cases for the blockchain, and other factors before committing any capital to the chain as nearly all projects are extremely new and (relatively) unproven.

Blockchain Gaming Projects & Scaling



Flow

The blockchain for open worlds.

Flow is a newer (2020), application-specific Proof of Stake (PoS) layer 1 blockchain, built by Dapper Labs of Crypto Kitties Fame, specifically for NFTs and games. After creating Crypto Kitties in 2017 and watching it clog the Ethereum blockchain to the point of $30+ fees, the team has been focusing on solving the issues of scalability and transactional capacity. The Flow blockchain is one of the largest and most successful NFT chains thanks in part to its stand-out products like NBA Top Shot, UFC on Flow, collection game Dr. Seuss, and more.

FLOW is the native token of the Flow blockchain used to pay for gas fees, as collateral, and is required to participate in community governance. The FLOW supply is capped at 1.25 billion but issuance up to that limit is variable based network fees. When the network fee is less than the fixed reward for nodes, additional token will be issued. Any amount exceeding the rewards for nodes are kept in a custodial account in order to control/limit the token inflation.

Flow's achieves higher transactions per second (TPS) capacity by separating the computing and consensus work among nodes. This means that one single node does not facilitate the whole transaction computing and verification process like in most layer 1s. On the Flow blockchain, there are four types of nodes and a node will only do one of the four jobs: the collection, consensus, execution, and verification of transactions. Collection nodes collect and send data to consensus nodes. Consensus nodes confirm transactions and send them to execution nodes. Execution nodes then send the computing result to verification nodes for verification. Information regarding which nodes are participating in which aspect of the blockchain is available on Flowscan.org.

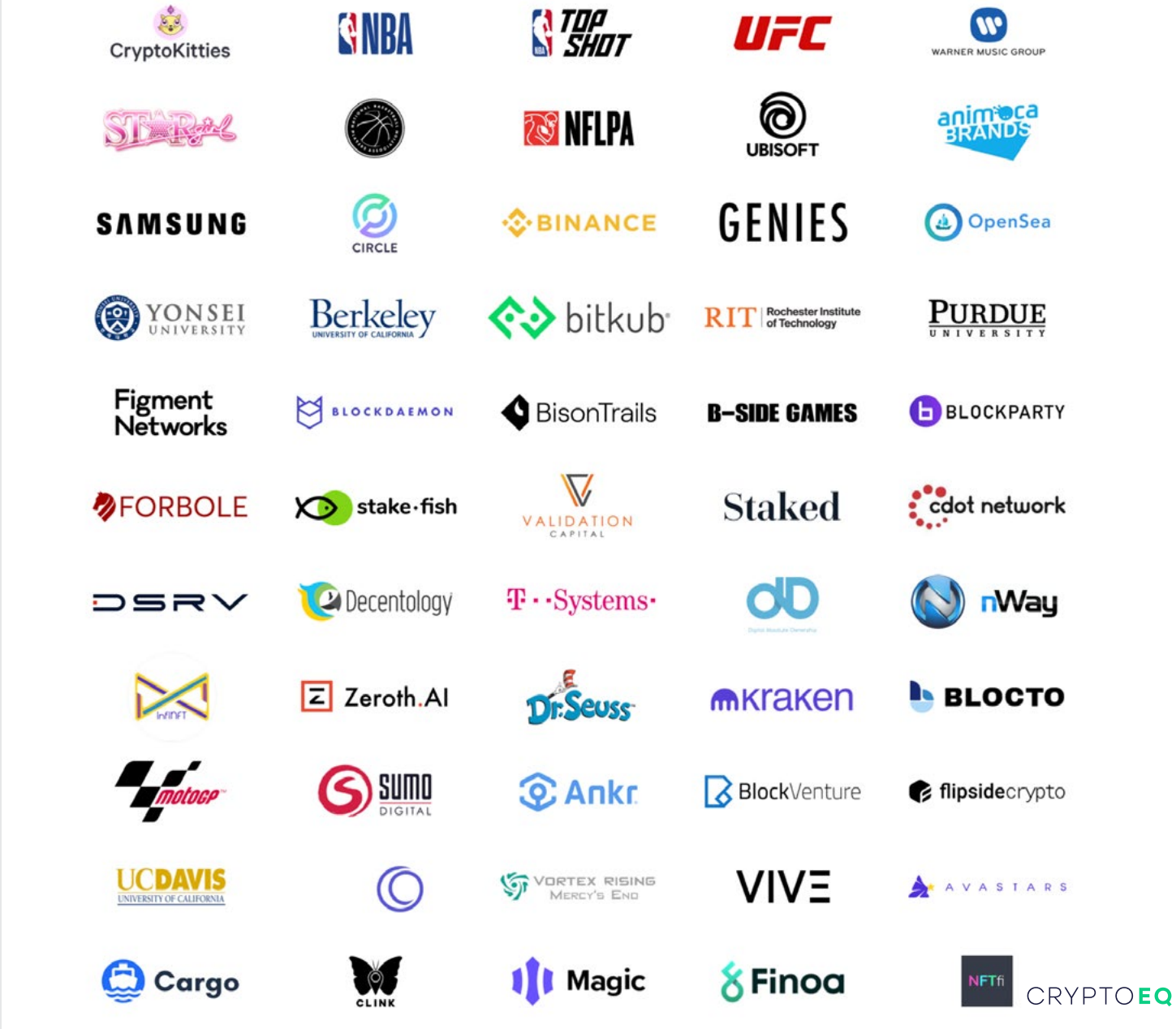
The separation of node workload reduces network dependency on highly-specialized professional nodes to handle a large number of transactions. this is how Flow achieves its transaction speed and volume with lower transaction cost.

Flow has seen tremendous adoption relative to other blockchains in large part to its partners and top app, NBA Top Shots. Apart from NBA, Flow's major partners include UFC, Warner Music, famous game developer Animoca, Unisoft, Samsung, and NFT trading platform Opeansea. IP from the like of the NBA, UFC, and others provide Flow a huge userbase from which to draw.

FLOW COMMUNITY

One of the largest online crypto communities

Source: OnFlow.org



Polygon

Top Polygon Games

1. REVV Racing
2. Neon District
3. Meeb Master
4. Aavegotchi
5. NEW Snook
6. 0xUniverse
7. LoserChick
8. My Crypto Heroes
9. PolyBlades
10. Cometh

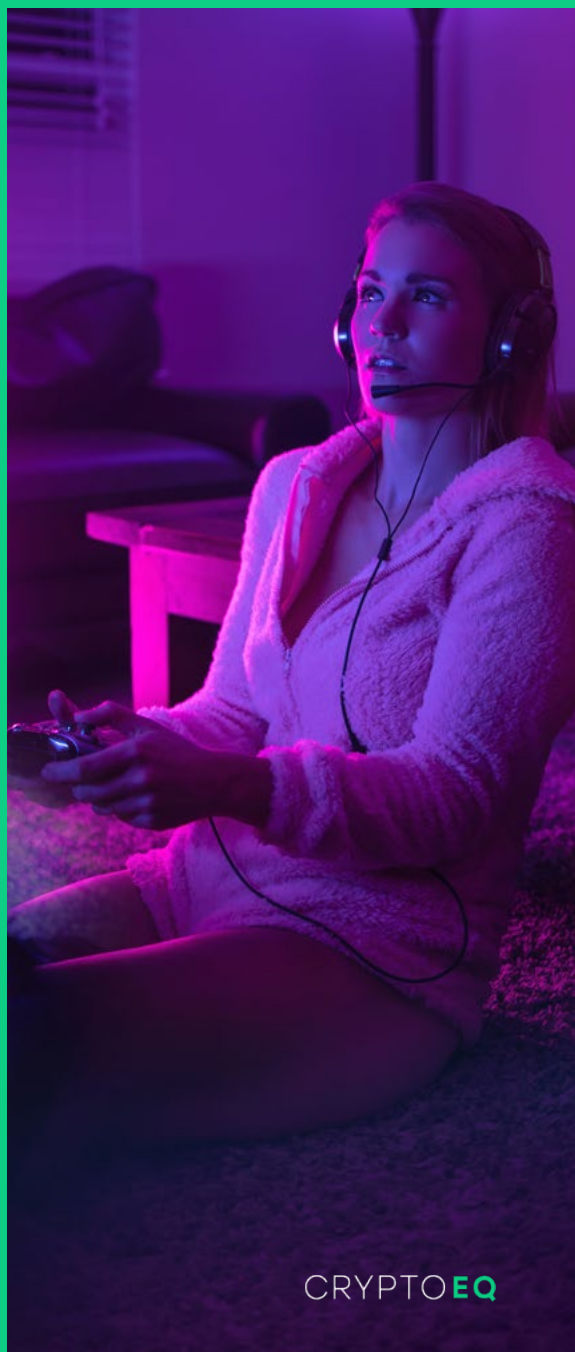
Polygon, formerly known as Matic Network, was founded by three crypto community members with the primary goal of expanding the capacity of the Ethereum network (and others in the future). There have been over 130 Dapps, 270,000 users, and 15 million transactions on the main net since it went live in June last year.

Technically, Polygon is its own blockchain (with its own token: MATIC) but was built to become Ethereum's internet of blockchains. Polygon provides the architecture that enables developers to create custom, application-specific chains that leverage Ethereum's security (to an extent) similar to the Cosmos hub-and-spoke model. It provides an interoperable layer that can bridge many different projects and scaling solutions such as ZK-rollups, optimistic-rollups, and sidechains (discussed below).

Polygon leverages two approaches for its scaling solutions: the Plasma blockchain and PoS side chain. The Plasma Chain shares the security mechanism with Ethereum, securing the protocol with Proof of Fraud and verification nodes. The Polygon PoS chain is a side chain with its own security guarantees, consensus mechanism, and attack vectors.

Since Polygon is a separate chain, it must be secured by a separate proof-of-stake consensus mechanism where validators stake MATIC. However, MATIC is staked in smart contracts on the Ethereum main chain. Polygon connects to Ethereum through a "bridge" with the use of a lock and mint mechanism. Users deposit funds into the bridge, which locks them in a smart contract on Ethereum and mints the equivalent amount on Polygon. To withdraw funds, you will have to go back through the bridge. The bridge (and funds) are secured by a 5/8 multi-sig scheme making it incredibly more centralized than the Ethereum mainchain. Additionally, ~33% of MATIC staked is run by a node controlled by Binance. These centralization factors should be considered when weighing the cost of transacting on layer 2.

Overall, Polygon combines the Plasma and PoS approaches to expand Ethereum's scalability. It increases efficiency, albeit with different security guarantees. In the future, Polygon plans to allow developers to use multiple Layer 2 solutions simultaneously, including Optimistic Rollup, ZK-rollup, and Validium.



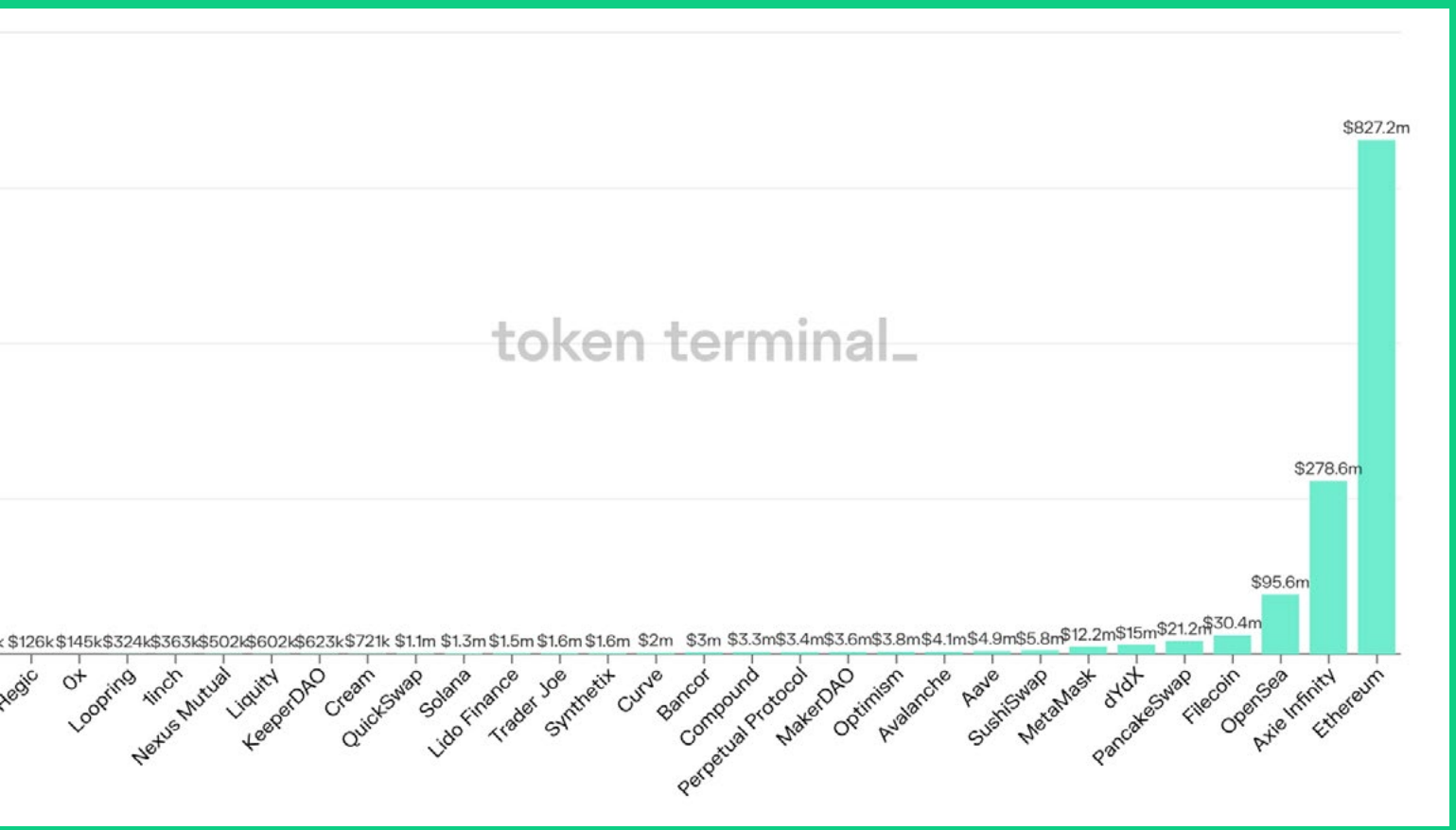
Ronin

Ronin is a purpose-built Ethereum side chain designed for Axie Infinity built by Sky Mavis. Ronin uses a Proof of Authority (PoA) consensus mechanism with the number of validators capped at 25. Validators are all approved by Sky Mavis.This makes Ronin a permissioned blockchain with totally different risks and trade-offs when compared to other solutions.

Notable validators include Unisoft, Animoca, Nonfungible.com, DappRadar, and Binance. As What Ronin has sacrificed in openness, decentralization, and permissionlessness, it has gained in scalability and customization. Ronin boasts near-real-time transaction, extremely low transaction cost, enhanced user experience, and free transfers between Ronin and the Ethereum mainchain.

Ronin experienced exponential growth in Q2 2021 but, overall, remains a nacsent sidechain with more work to do around Axie Infinity's NFT world.

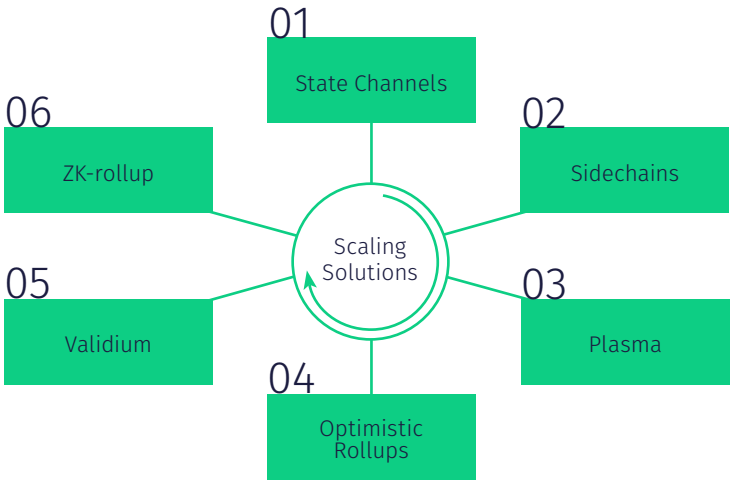
Axie Infinity is a blockchain play-to-earn strategy game that often draws comparisons to PokemonGo. Players can battle, raise, and trade fantasy creatures called Axies and use the Small Love Potions (SLP) tokens to breed and trade Axies.



Source: Token Terminal

Ethereum L2 Scaling Solutions

	State channels	Sidechains	Plasma	Optimistic Rollups	Validium	ZK-rollup
Security						
Liveness Assumption	Yes	Bonded	Yes	Bonded	No	No
The mass exit assumption	No	No	Yes	No	No	No
Quorum of validators can freeze funds	No	Yes	No	No	Yes	No
Quorum of validators can confiscate funds	No	Yes	No	No	Yes	No
Vulnerability to Hot-Wallet key exploits	High	High	Moderate	Moderate	High	Immune
Vulnerability to crypto-economic attacks	Moderate	High	Moderate	Moderate	Moderate	Immune
Cryptographic primitives	Standard	Standard	Standard	Standard	New	New
Performance / Economics						
Max Throughput on ETH 1.0	1..∞ TPS	10k+ TPS	1k...9k TPS	2k TPS	20k+ TPS	2k TPS
Max Throughput on ETH 2.0	1..∞ TPS	10k+ TPS	1k...9k TPS	20k+ TPS	20k+ TPS	20k+ TPS
Capital-efficient	No	Yes	Yes	Yes	Yes	Yes
Separate offchain tx to open new account	Yes	No	No	No	No	No
Cost of tx	Very low	Low	Very low	Low	Low	Low
Usability						
Withdrawal Time	1 confirm	1 confirm	1 week	1 week	1...10 minutes	1...10 minutes
Time to subjective finality	Instant	N/A (Trusted)	1 confirm	1 confirm	1...10 minutes	1...10 minutes
Client side verification of subjective finality	Yes	N/A (Trusted)	No	No	Yes	Yes
Instant tx confirmations	Full	Bonded	Bonded	Bonded	Bonded	Bonded
Other Aspects						
Smart Contracts	Limited	Flexible	Limited	Flexibile	Flexible	Flexible
EVM-bytecode portable	No	Yes	No	Yes	No	No
Native privacy options	Limited	No	No	No	Full	Full



Rollups

Rollups improve scalability by combining or "rolling up" sidechain transactions into a single transaction, generating a cryptographic proof (called a SNARK), and then submitting only the proof to the base layer. This removes the burden of data on layer 1 while also allowing layer 2 transaction data to be available on Layer 1 for validation. Moving transactions on a rollup layer 2 solution guarantees that one could verify the integrity of the data if it is actually present. Scalability is improved on the base layer due to the lack of reliance on Layer 1 storage.

Rollups offer similar capabilities as Plasma, but without suffering from the "data availability problem". Rollups offer many-to-many transactions, smart-contract capabilities, and significantly reduced total L1 block space requirements all while extending Ethereum's security assurance to the L2.

There are 2 types of rollups: ZK-rollups and optimistic rollups.

ZK-rollups are faster and more efficient than optimistic rollups, but they suffer from friction and compatibility issues when migrating smart contracts to layer 2. Loopring, Deversifi, and zkSync are good examples of projects utilizing ZK-rollups.

Optimistic rollups run an EVM-compatible Virtual Machine called OVM (Optimistic Virtual Machine) that removes the compatibility issues that exist in ZK-rollups. This is extremely critical as composability is paramount in the Ethereum ecosystem, especially in DeFi. Projects working on optimistic rollups are Optimism and Arbitrum One.

Arbitrum fully launched to the public in August 2021 and while it intends to fully decentralize in the near future, at the moment, the team has significant control over the network like the ability to modify key contracts within the system. This safeguard was purposely put in place to protect the stability of the network in the early rollout phase. It is also noteworthy that the team has stated they will halt network activity in the event of a technical or security issue.

Rollups can 100x Ethereum's scaling without ETH 2. With ETH 2 + Rollups (years away), scaling should theoretically reach 25k-100k transactions per second (TPS). There is increasing competition among various types in the rollup space with the trend being towards EVM compatibility and catering towards various needs of dApps.

Ethereum layer 2 scaling solution projects include:

ZKSwap

zkSync

Hermez Network

ImmutableX

DeversiFi

Arbitrum: Live but in limited capacity.

Aztec: Live on mainnet with privacy smart contracts platform that will be released later in 2021.

StarkWare: Released in 2021 followed by an AMM, Caspian, in June 2021.

Optimism: Live but in limited capacity.

Optimistitic vs. ZK-Rollups

Property	Optimistic Rollups	ZK-rollups
Fixed gas cost per batch	~40,000 (a lightweight transaction that mainly just changes the value of the state root)(verification of a ZK-SNARK is quite computationally intensive)	~500,000 (verification of a ZK-SNARK is quite computationally intensive)
Withdrawal period	~1 week (withdrawals need to be delayed to give time for someone to publish a fraud proof and cancel the withdrawal if it is fraudulent)wait for the next batch)	Very fast (just wait for the next batch)
Complexity of technology	Low	High (ZK-SNARKs are very new and mathematically complex technology)
Generalizability	Easier	Harder (ZK-SNARK proving general-purpose EVM execution is much harder than proving simple computations, though there are efforts (eg. Cairo) working to improve on this)
Per-transaction on-chain gas costs	Higher	Lower (if data in a transaction is only used to verify, and not to cause state changes, then this data can be left out, whereas in an optimistic rollup it would need to be published in case it needs to be checked in a fraud proof)
Off-chain computation costs	Lower	Higher (ZK-SNARK proving especially for general-purpose computation can be expensive, potentially many thousands of times more expensive than running the computation directly)

Rollups are a new layer-2 scaling model that is likely to be a popular foundation for Ethereum scaling now and in the future. They've sparked significant interest since they can quickly transition existing apps to layer-2. By leaving a trace amounts of data on the blockchain, they accomplish this quickly and efficiently. While rollups are still a relatively new niche, they are nevertheless exciting and hold promise for the next period in blockchain scaling innovation.

Immutable X

Immutable X is an Ethereum scaling solution co-created by StarkWare Labs and the blockchain card game Gods Unchained that utilizes zero-knowledge proof technology and can achieve (theoretically) 9,000 TPS and nearly free transaction fees.
Immutable X adopts ZK-rollups as its scaling solution (discussed above), however, ZK-rollups have very basic functionality compared to what Immutable X is after. Therefore, StarkWare is now developing under a new programming language called CAIRO to enhance ZK-rollup's flexibility and make it more general-purpose as opposed to a more narrow focus on transfers.
NFT projects using Immutable X include previously mentioned card game Gods Unchained, NFT platform Mintable, Epics.GG, battle game Illuvium, VR game Guild of Guardians, and others. Gods Unchained is Immutable's first blockchain-based e-sports and card trading game. Cards can be traded on Opensea, and the card value varies based on the card rarity.

IMMUTABLE X

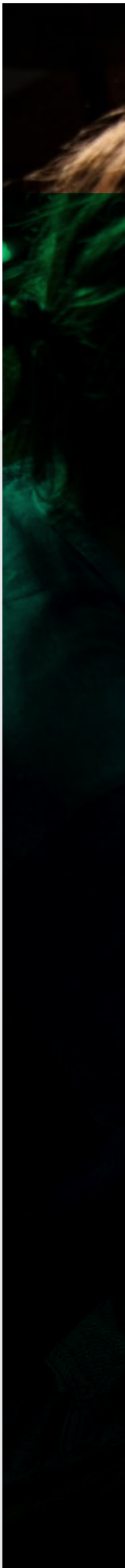
20k+

Trades Per Second on the Ethereum Network

Zero gas fees, instant trades and scalability for games, applications, marketplaces, without compromise.

"Immutable X allows us to implement new meta systems in our game that were previously impossible."
—Chris Clay, Game Director, Gods Unchained

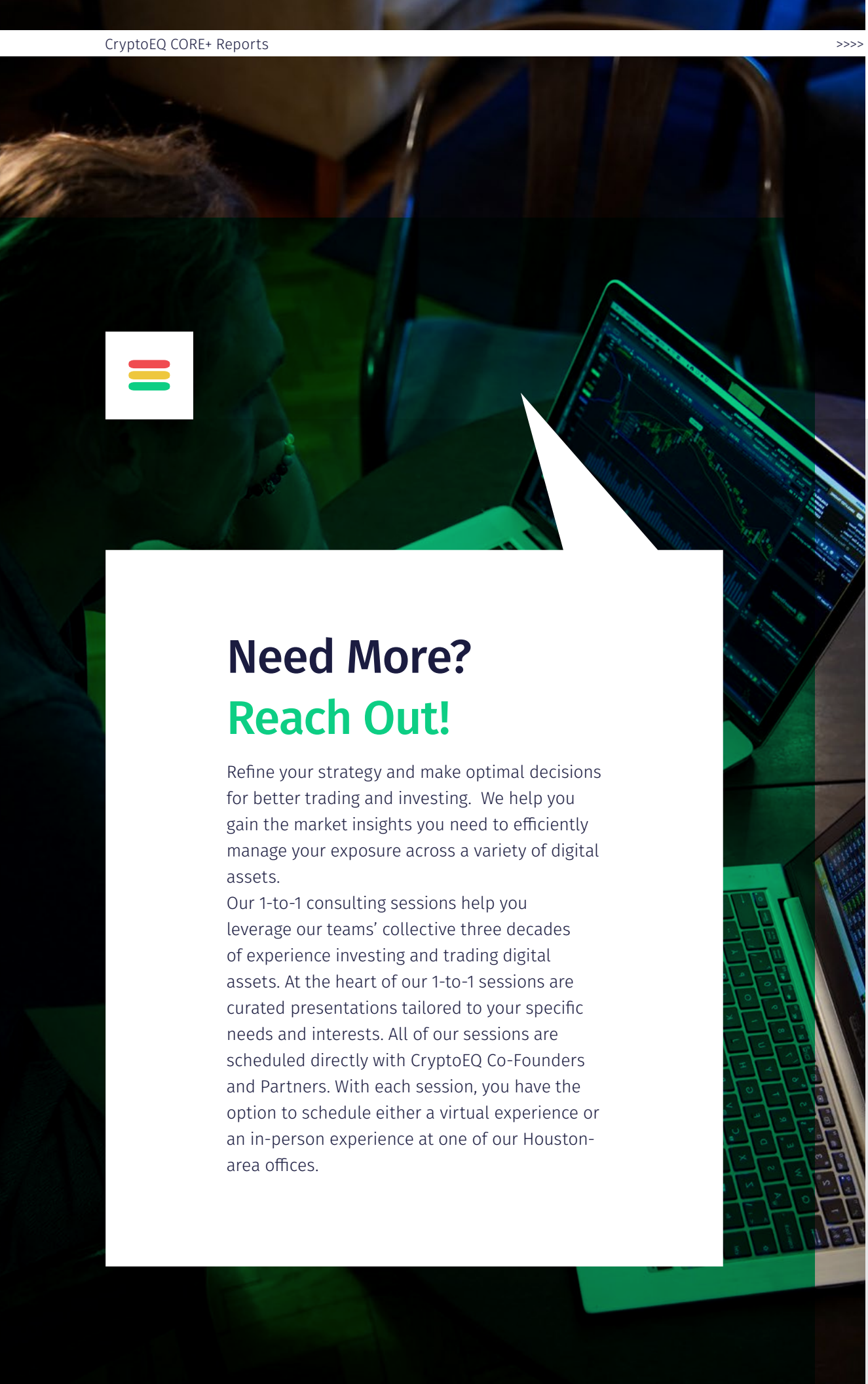
Final Words
Our Story



Like most disruptive tech startups, CryptoEQ started as a small group of like-minded individuals.

Each of our co-founders—Spencer Randall, Michael Thoma and Brooks Vaughan—were cryptocurrency investors and traders before the crypto explosion of 2017. They met attending local crypto conferences and immediately began to admire each other's perspective and maverick approach to the assets available on the market. After some time getting to see each other in action, they each noticed a glaring hole in the crypto-asset market — truly unbiased, thorough insights and research.

We launched CryptoEQ v1 in July 2019 and acquired approximately 3,000 new users. Meeting our goal to always be launching, CryptoEQ v2 debuted in January 2020 with new features and an all-new sales funnel. Our third iteration, v3, launched in June 2020 with average quarterly revenue growth of over 300%. We also blew through our 5,000-user milestone. Recently, our v4 launch incorporated a new and intuitive user interface and exclusive 1-on-1 consulting sessions pushing us past 20,000 users. And currently, we're tracking to exceed our next goal of 50,000 users!



Need More?
Reach Out!

Refine your strategy and make optimal decisions for better trading and investing. We help you gain the market insights you need to efficiently manage your exposure across a variety of digital assets.

Our 1-to-1 consulting sessions help you leverage our teams' collective three decades of experience investing and trading digital assets. At the heart of our 1-to-1 sessions are curated presentations tailored to your specific needs and interests. All of our sessions are scheduled directly with CryptoEQ Co-Founders and Partners. With each session, you have the option to schedule either a virtual experience or an in-person experience at one of our Houston-area offices.

McClure Innovation Fund

CRYPTOEQ

Blockchain Gaming

CryptoEQ CORE+ Series

Contact
Team@CryptoEQ.io
Houston, Texas
United States