

Layer 2s: A REVIEW ON THEIR RECENT PERFORMANCE AND DEVELOPMENTS



Key Takeaways

The development of Layer 2 scaling solutions has made significant strides in recent years. According to L2Beat data, there are currently 71 live Layer 2 projects, with an additional 81 slated for launch. Moreover, approximately 90% of Ethereum-based transactions now occur on Layer 2 networks, underscoring the growing prominence of these solutions in the current market. Rollups have emerged as the dominant category among the various Layer 2 scaling solutions, achieving the highest adoption and usage rates. Within this category, Optimistic rollups lead in user activity, accounting for approximately 80% of transactions at the time of writing. Base and Blast are two of the fastest-growing Layer 2 projects in 2024, experiencing a rapid surge in user activity. Base's growth is primarily driven by meme coin activity, alongside increasing developer engagement and notable traction through SocialFi applications. In contrast, Blast's expansion is largely attributed to successful marketing strategies and attractive yield offerings, attracting significant market attention. In addition to analyzing the network and token performance of Layer 2 projects, this report also explores recent developments in major Optimistic and Zero-Knowledge rollups, highlighting key events and initiatives that drive their network activity. The outlook for Layer 2s as a sector remains bright. The notable adoption of these networks underlines their status as a cornerstone of the on-chain ecosystem, and their steady advancements demonstrate their potential for the coming months and years.

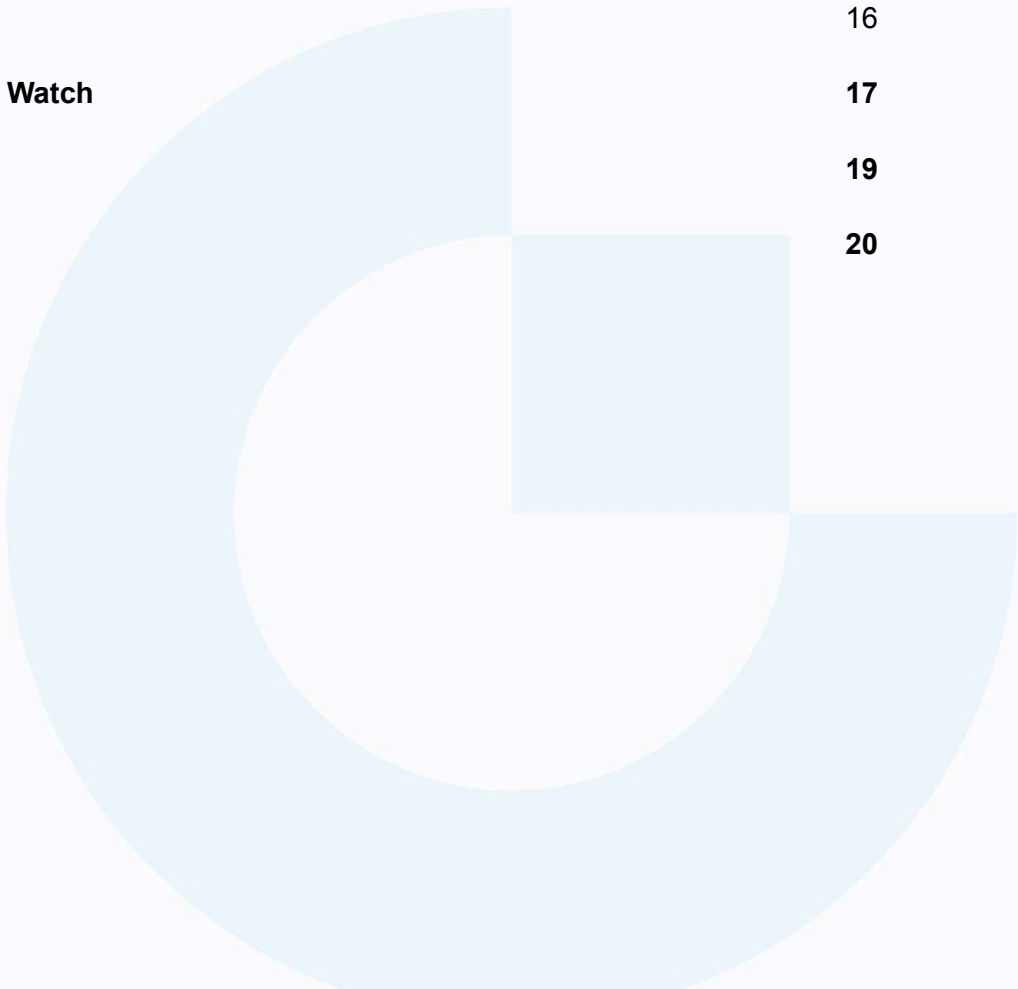
Key Word

Gate Research, Layer2s, ZK-Rollup, Optimistic



Layer 2s: A Review on Their Recent Performance and Developments

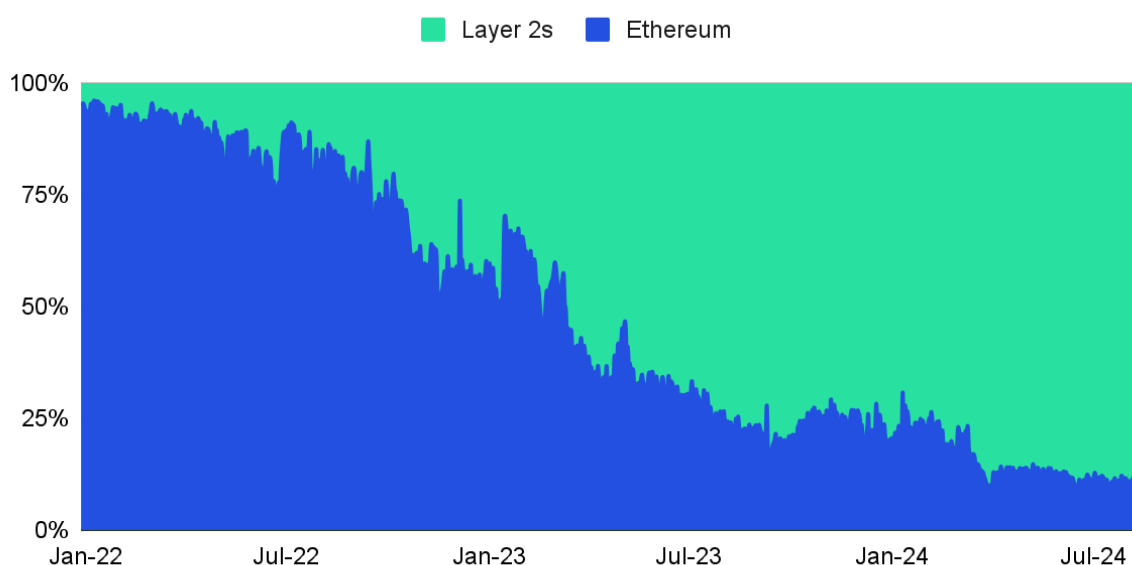
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1. Introduction

In recent years, the development of Layer 2 (L2) scaling solutions has advanced significantly, aligning with Ethereum co-founder [Vitalik Buterin's vision](#) of a rollup-centric future. According to [L2Beat data](#), 71 live L2 projects are currently with an additional 81 slated for launch. Beyond the flurry of development activity, the adoption rate of these L2 solutions is also noteworthy, with approximately 90% of Ethereum-based transactions now occurring on L2 networks, showcasing the prominence of L2 projects in the current market.

Figure 1: 90% of Ethereum-based transactions now occurring on L2 networks



Source: Artemis, as of August 22, 2024

This report provides a comprehensive overview of the L2 scaling solutions that are gaining traction. We begin by examining data-driven aspects of these networks, focusing on fundamental metrics and the factors contributing to their current dynamics. We then analyze the token performance of select L2s, providing insights into their market behavior.

Subsequently, we discuss notable developments within these L2 projects, highlighting significant initiatives and their implications for the ecosystem. To conclude, we will identify key themes and trends that are likely to influence the future landscape of the market, offering insights into the evolving dynamic of L2 ecosystem.

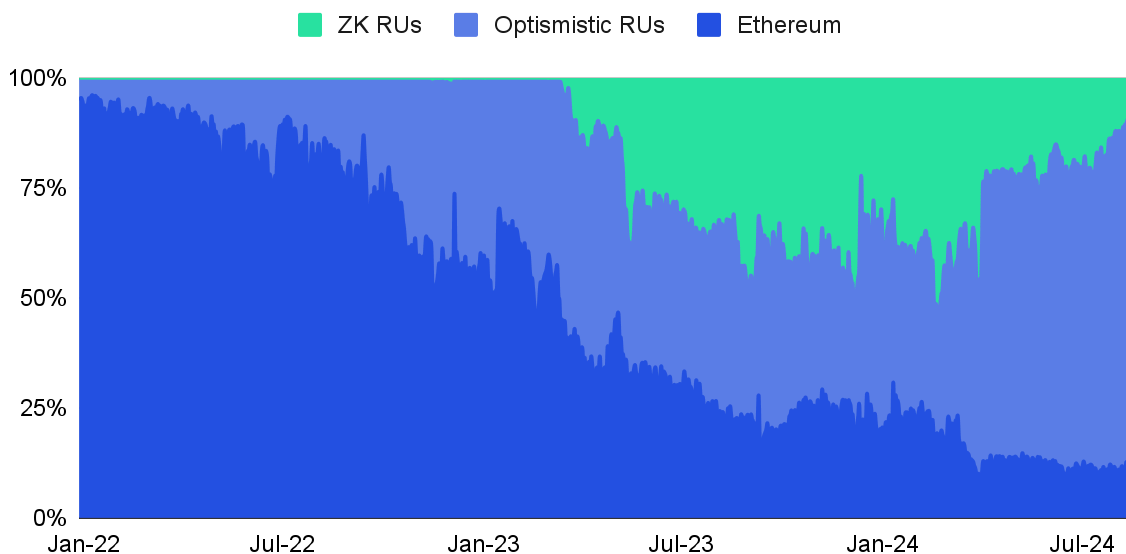
2. Market Dynamics

L2 scaling solutions can be broadly classified into several categories, including Rollups, Sidechains, Validium, and Optimum, each offering distinct features and trade-offs. **Among these, rollups have emerged as the dominant category, achieving the highest adoption rate and usage.** Rollups operate as separate blockchains that extend Ethereum's scalability by processing transactions off-chain and then submitting a condensed version of those transactions back to the Ethereum mainnet. This approach allows rollups to inherit the robust security of Ethereum while distributing the execution workload, thus significantly increasing throughput.

Rollups are further divided into two main types: Optimistic and Zero-Knowledge (ZK) rollups. Optimistic rollups operate under the assumption that all transactions are valid by default but allow for challenges if necessary. On the other hand, ZK rollups utilize validity proofs where transactions are computed off-chain, and compressed data is provided to the Ethereum mainnet as proof of their validity, ensuring immediate finality without the need for fraud proofs.

Currently, Optimistic rollups lead in terms of user activity, as illustrated in Figure 2, which shows that they account for approximately 80% of transactions at the time of writing. This dominance is partly due to the first-mover advantage enjoyed by platforms like Arbitrum and Optimism, which have capitalized on the slower development pace of ZK rollups to capture a significant user base, making them the preferred choice for many users and developers.

Figure 2: Optimistic rollups account for approximately 80% of transactions



Source: Artemis, as of August 22, 2024

Conversely, ZK rollups saw an expansion in user activity from mid-2023 to early 2024, followed by a notable decline. This fluctuation is likely tied to user behavior, such as airdrop farming, which temporarily boosted network activities. Once the incentives subsided, and tokens were launched, user interest and network activity diminished.

Table 1: Basic features and metrics of some of the popular L2s

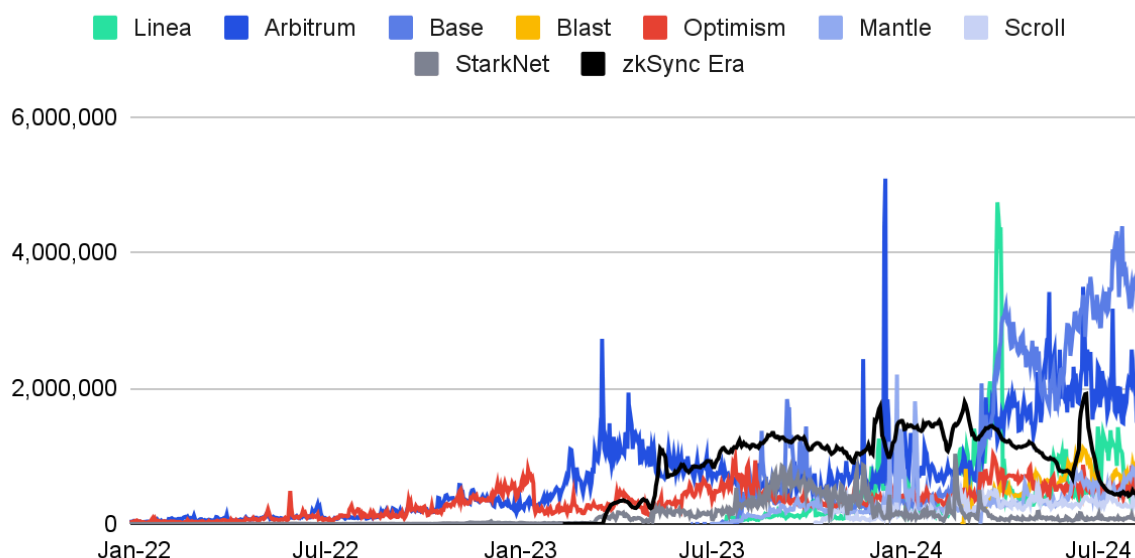
Logo	Project	Type	Launch Date	TVL	MCAP	TX Cost
	Arbitrum	Optimistic	August'21	\$2.72B	\$1.88B	\$0.007
	Base	Optimistic	July'23	\$1.52B	-	\$0.003
	Optimism	Optimistic	December'21	\$0.61B	\$1.62B	\$0.005
	Blast	Optimistic	February'24	\$0.85B	\$205.01M	\$0.001
	Mantle	Optimistic	July'23	\$0.48B	\$1.96B	\$0.007
	Scroll	Zk	October'23	\$0.69B	-	\$0.034
	Zksync Era	ZK	March'23	\$0.08B	\$421.01M	\$0.017
	Linea	ZK	July'23	\$0.53B	-	\$0.013
	Starknet	ZK	November'21	\$0.23B	\$602.28M	\$0.002
	Metis	Optimistic	November'21	\$44.02M	\$187.37M	\$0.006
	Taiko	ZK	May'24	\$14.87M	\$121.59M	\$0.004
	Polygon zkEVM	ZK	March'23	\$15.16M	-	\$0.007

Source: Artemis, CoinMarketCap, growthepie, L2Beat, as of August 22, 2024

Taking a closer look, Arbitrum, Base, and Blast are the standout networks in terms of user activity, collectively commanding a market share of 80%. Notably, Base has been a significant highlight throughout 2024, experiencing a dramatic surge in its daily transactions—from an average of 300K to between 3 and 4 million daily. This increase positions Base as the leader in transaction volume among its peers. The remarkable increase in Base's network activity can primarily be attributed to the network's burgeoning meme trading culture. **Tokens such as \$BRETT, \$DEGEN, and \$TOSHI are the prime**

examples of this trend, driving significant user engagement and transaction volume. Additionally, Base leads among its Optimistic rollup peers in terms of developer activity, boasting the highest number of new contracts deployed and new contract deployers, as reported by Artemis data.

Figure 3: Arbitrum and Base are the standout networks in terms of user activity

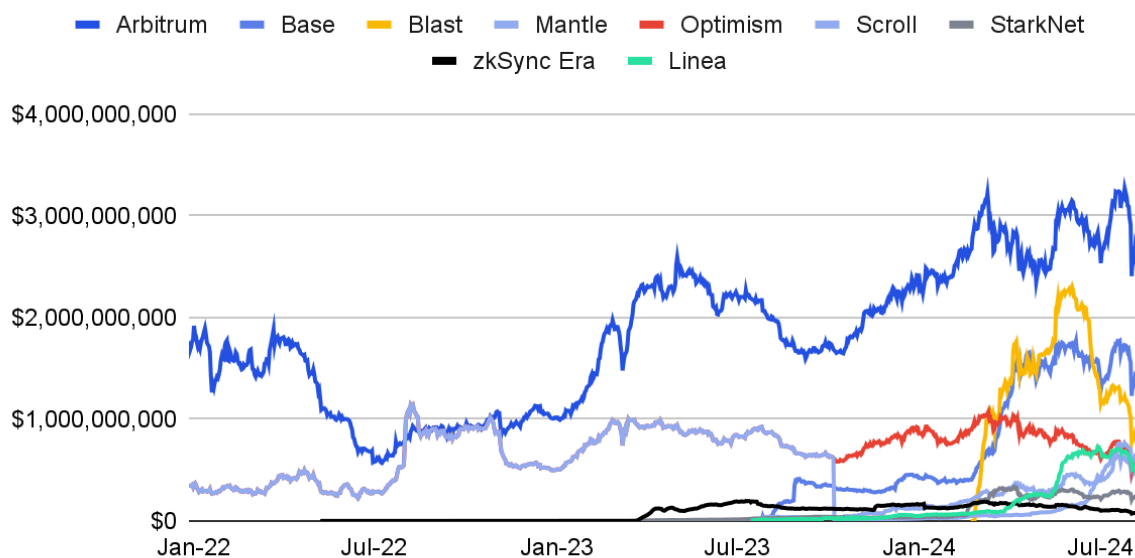


Source: Artemis, as of August 22, 2024

An analysis of the total value locked (TVL) across Layer 2 networks shows a similar trend to transaction volumes. Arbitrum remains the category leader, primarily due to its status as the DeFi hub among L2s. Notable DeFi projects on Arbitrum, such as GMX, Pendle Finance, and Vertex, significantly contribute to its vibrant ecosystem. Base secures the second position, with its TVL experiencing a YTD growth of 245%, now amounting to around US\$1.5 billion. **A substantial portion of this growth is driven by Aerodrome, a leading decentralized exchange (DEX) on Base, which accounts for a third of Base's TVL.** Aerodrome, a ve(3,3) MetaDEX, integrates features from Uniswap v2 and v3, Curve Finance, and Convex into a single protocol. Its success can be attributed to the ve(3,3) model which creates a flywheel effect—enhancing TVL, volume, revenue, and user base and engagement, resulting in a YTD TVL increase of 395%. Blast is another L2 network that witnessed significant growth in 2024. Its initial success was driven by its incentive program and the yield opportunities it offered. Launched in February 2024, Blast quickly amassed over US\$2B in just a few months, at one point becoming the largest L2 by TVL. However, following the conclusion of its incentive program and the launch of its token in June 2024, Blast's TVL underwent a significant correction of almost 50%, relegating it to third place among its peers. Although the second phase of Blast's incentive program has been announced following the end of the first season, the new details released by the team have yet to generate significant

interest among users. The future evolution of Blast's usage and its ability to maintain or grow its user base in the coming months remains to be seen.

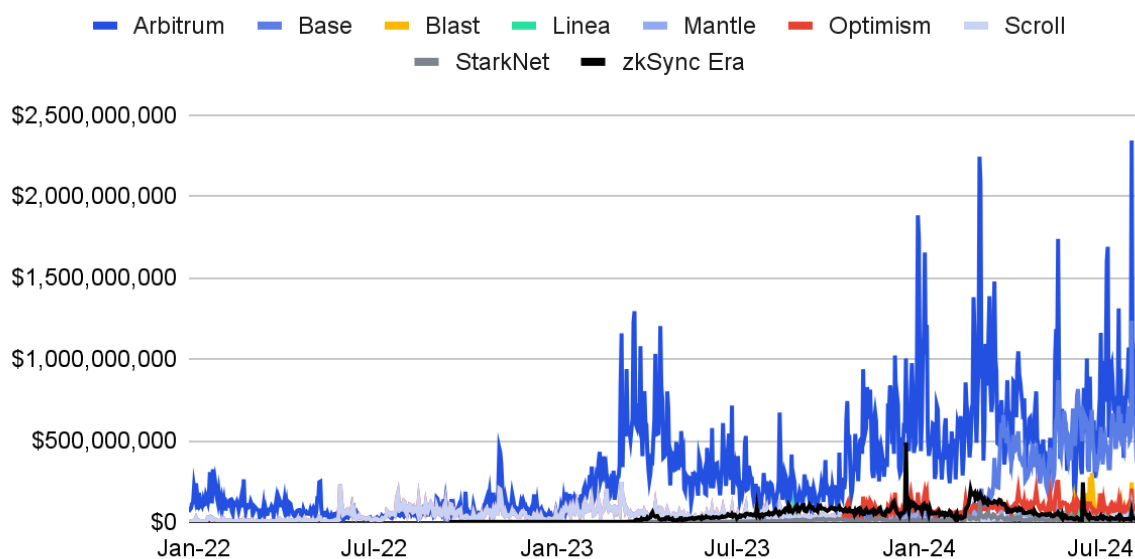
Figure 4: Arbitrum and Base remain as the leader in terms of TVL



Source: Artemis, as of August 22, 2024

Arbitrum and Base are unsurprisingly the leaders in terms of DEX trading volume among the L2 networks.

Figure 5: Arbitrum and Base continues to lead in terms of DEX trading volume

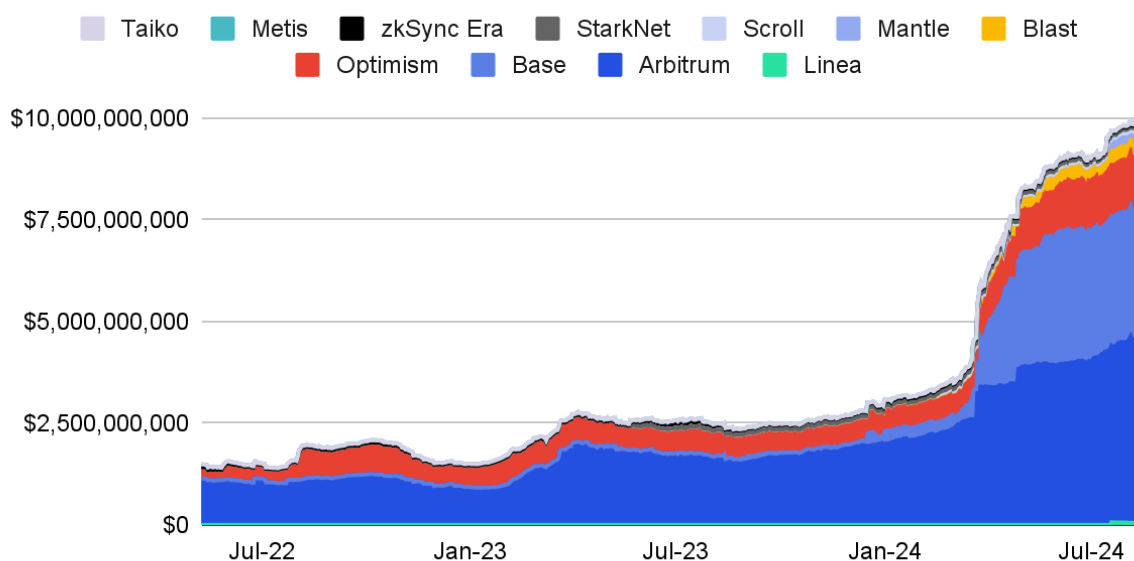


Source: Artemis, as of August 22, 2024

As the premier DeFi hub among Layer 2 networks, Arbitrum consistently showcases the most vibrant DeFi activities relative to its peers. As illustrated in Figure 6, **Arbitrum has maintained the highest DEX trading volume since 2022, and this volume has seen significant growth since late 2023, paralleling the resurgence in the broader market.** Base, currently holding the position as the second most active L2 in terms of DEX trading volume, has seen its activity bolstered by an increase in meme coin trading and the growth of Aerodrome, a major decentralized exchange on the platform. The heightened activity on Base highlights its emerging role as a significant player in the L2 space. Conversely, other L2 networks have shown less robust DeFi activities, which is a primary factor contributing to their weaker performance.

Stablecoins serve as the predominant medium of exchange and store of value in the crypto market. They are widely used by market participants for purchasing other cryptocurrencies. As such, the amount of stablecoin within a network could be seen as an indicator gauging how market participants perceive a given network, such as how many potential opportunities the network could have. **If market participants deem a network has lots of opportunities, this will translate to users holding a large amount of stablecoin within that network to capitalize on potential opportunities.**

Figure 6: Base holds the second-largest stablecoin market cap among L2 networks



Source: DeFiLlama, as of August 22, 2024

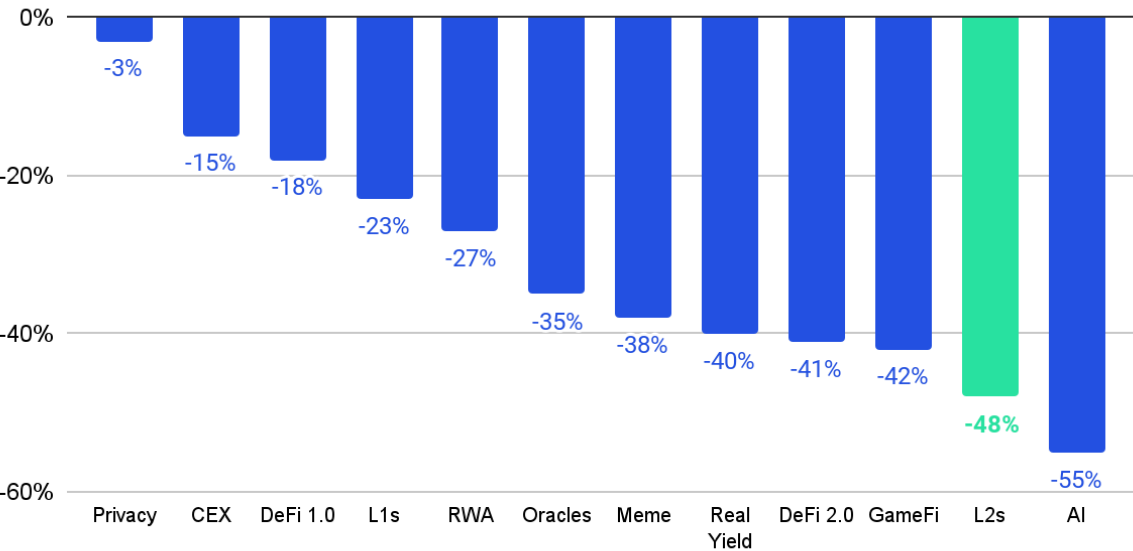
Base currently holds the second-largest stablecoin market cap among L2 networks, reflecting the rapid growth it has experienced in recent months. The meme coin mania within the network has attracted significant liquidity from market participants, leading to an increased accumulation of stablecoins.

Arbitrum remains the leader in stablecoin market cap, with approximately US\$4.5 billion. Following Arbitrum and Base are Optimism and Blast, with stablecoin holdings of over US\$3 billion and US\$282 million, respectively. The substantial gap between Arbitrum, Base, and other Layer 2s underscores their dominant positions in the market, which are unlikely to be challenged in the near term.

The analysis of network metrics reveals that in the current Layer 2 landscape, Optimistic Rollups are leading in overall adoption and usage, with significant disparities across several key metrics when compared to ZK Rollups. Among the Optimistic Rollups, Arbitrum and Base have consistently ranked at the top in nearly every category. In particular, Base has emerged as a standout in the L2 ecosystem in 2024, fueled by the meme coin frenzy and increasing developer activity. **Notably, the surge in network activity has also positioned Base as the highest revenue-generating L2 year to date, surpassing all other rollups with a YTD revenue of US\$47.5 million, according to Artemis data.**

Beyond network metrics, another aspect to look at when examining the performance of L2s is their token performance. According to a Dune dashboard that demonstrates the price performance of different sectors over a 3-month period, the performance of L2 tokens is at the bottom of the least, suffering a near 50% decline over the past three months.

Figure 7: L2 is one of the weakest performing narratives over the last 3 months

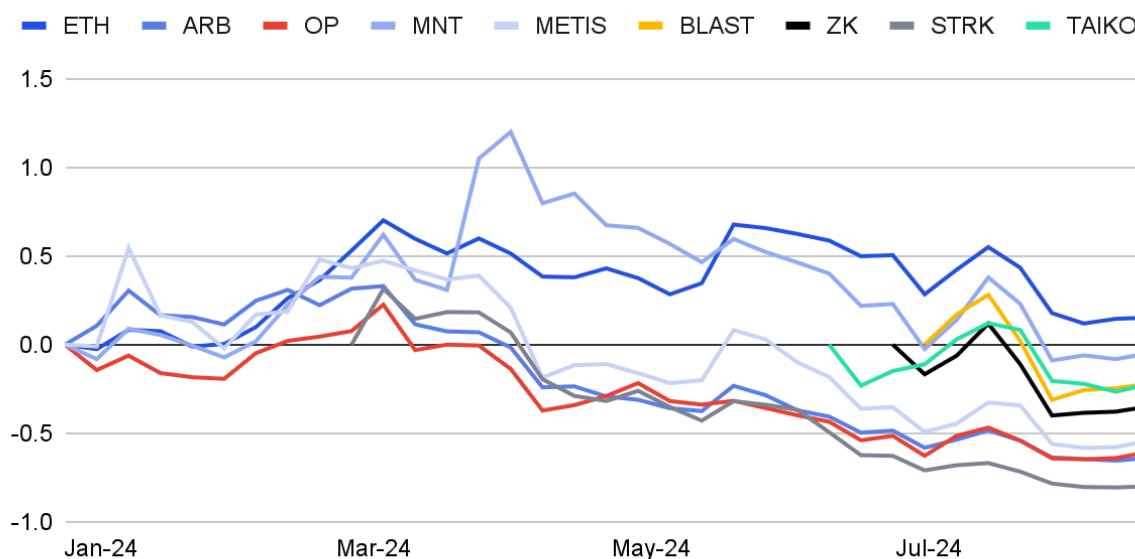


Source: Dune Analytics (@cryptokoryo), as of August 22, 2024

A key factor contributing to the divergence between the growing adoption of Layer 2 networks and the underperformance of their tokens is the lack of value accrual mechanisms for L2 tokens. Despite the expansion across various metrics, **L2 token holders do not directly benefit from this growth.** Furthermore, many L2 tokens exhibit a

'low float, high FDV' characteristic, **meaning that token holders face ongoing selling pressure due to multiple upcoming token unlocks over the next months and years.** For example, the market cap to fully diluted value (FDV) ratios for ARB, OP, and BLAST are 0.35, 0.27, and 0.19, respectively. This dynamic diminishes the attractiveness of holding these tokens for the long term, especially in a market environment where the 'low float, high FDV' narrative is largely unfavorable.

Figure 8: ETH outperforms all the other L2 tokens year to date



Source: CoinMarketCap, as of August 22, 2024

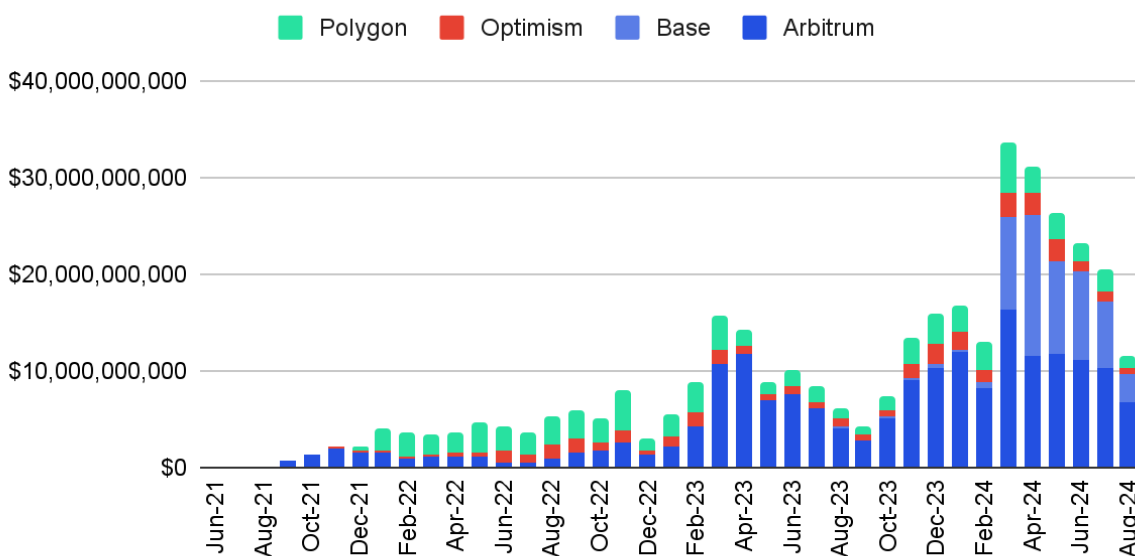
When comparing ETH with L2 tokens, **ETH has outperformed all of them year to date.** Beyond the previously mentioned factors contributing to the weak performance of L2 tokens, the disparities between ETH and L2 tokens may also be attributed to the compelling narratives surrounding ETH, making it a more attractive asset to hold. These narratives include the rising trends of restaking and liquid restaking, which have dominated the DeFi space in recent months, as well as the approval of spot Ethereum ETFs. Additionally, **ETH remains a widely utilized asset across the on-chain ecosystem, unlike L2 tokens, which often lack substantial use cases beyond their respective networks.** This performance comparison also challenges the common belief that L2 tokens can serve as ETH Beta, performing well in tandem with ETH. In reality, ETH possesses distinct characteristics that set it apart from most L2 tokens.

3. Recent Developments of the Key Players

3.1 Arbitrum

Arbitrum continues to dominate the Layer 2 landscape in 2024, leading the sector with the highest TVL and DEX trading volume. Notably, according to a Dune dashboard by Uniswap Labs, Arbitrum continues to have the highest Uniswap volume among all L2s. **However, Arbitrum faces growing competition from the rise of Base and Blast, particularly the former.** Base's explosive growth in 2024 has positioned it as a close competitor to Arbitrum, with several of its metrics closely trailing those of Arbitrum. **Despite Arbitrum's leadership in network metrics, its native token, ARB, has not outperformed other L2 tokens, with its market cap stagnating and remaining in tight competition with other L2 governance tokens.** Importantly, the Arbitrum team has recently introduced a [technical roadmap](#) aimed at driving innovation, and the Arbitrum DAO has passed a significant proposal to introduce a staking feature for the ARB token, signaling potential catalysts for ARB's future performance.

Figure 9: Arbitrum continues to have the highest Uniswap volume among all L2s



Source: Dune Analytics (@uniswaplabs), as of August 22, 2024

Offchain Labs' Technical Roadmap^[1]

- Offchain Labs, the team behind Arbitrum, released a technical roadmap on August 20, outlining a series of initiatives aimed at enhancing user experience, decentralization, and performance within the Arbitrum network.
- Key initiatives in the roadmap include Bounded Liquidity Delay (BoLD), Censorship Timeout, Decentralizing the Sequencer, Fast Withdrawals, Chain Clusters, Multi-client

Support, and Adaptive Pricing. These developments are scheduled for the second half of 2024 and into 2025, reflecting Offchain Labs' commitment to making blockchains more accessible while upholding the core values of decentralization.

- Notably, the roadmap also introduces the concept of ZK+Optimistic Hybrid Proving, which suggests that ZK proofs could eventually be used to instantly confirm assertions, offering an optional and expedited path to confirmation on the parent chain.

ARB Staking Proposal

- In August 2024, Arbitrum DAO passed a proposal that aims to enhance the value accrual of ARB token.
- The proposal aims to let ARB token holders stake and delegate their tokens in return for a liquid staked ARB token (stARB) representing their stake, which will have features like auto-compounding, restaking options, and can be utilized within the DeFi ecosystem.

3.2 Optimism

Compared to its peer Optimistic Rollups, Optimism's performance in 2024 has not been as prominent, with lower TVL, transaction count, and active addresses than chains like Arbitrum and Base. **However, while Optimism may appear relatively lackluster when viewed in isolation, a broader perspective on the OP Stack-based chains reveals a different picture. The rapid growth of Layer 2s like Base and Blast highlights the explosive expansion of the Superchain ecosystem.** The Superchain refers to a network of chains built on the OP Stack that share bridging, decentralized governance, upgrades, a communication layer, and more. As Base and Blast have emerged as two of the fastest-growing L2s this year, their success translates into significant growth for the Superchain ecosystem as a whole. Notably, an [agreement](#) between Optimism and Base stipulates that a portion of Base's transaction proceeds will be directed to the Collective through an on-chain contract. Specifically, the greater of (a) 2.5% of Base's total sequencer revenue or (b) 15% of Base's net on-chain sequencer revenue (L2 transaction revenue minus L1 data submission costs) will be allocated to the Collective, **allowing Optimism to directly benefit from Base's impressive revenue performance this year.**

Optimism Foundation Disables Permissionless Fraud Proofs

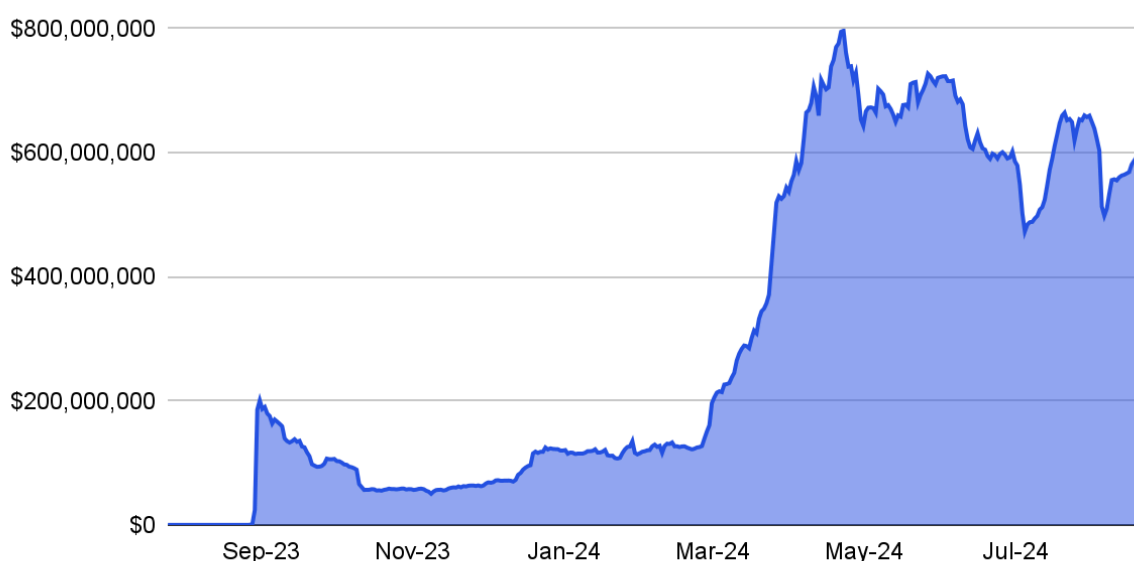
- Recently, the Optimism Foundation disabled permissionless fraud proofs after community audits revealed significant vulnerabilities in its fraud-proof contracts, aiming to prevent potential exploitation.

- To address the issue, a "Granite" hard fork is scheduled for September 10th to address these vulnerabilities and ensure network stability.

3.3 Base

Base is the top performing L2 project in 2024. With the explosive growth in its overall metrics, it has become a strong competitor to Arbitrum. Regarding DeFi, Base has Aerodrome, which contributed significantly to Base DeFi growth, along with the robust meme coin trading and accelerating developer activity mentioned in previous sections. **Another use case that saw decent traction on Base is SocialFi. Project like Friend.tech is a prominent example.** Friend.tech is a decentralized social platform operating on Base. It allows users to buy shares of their favorite KOLs, offering exclusive access to private chats. Simply put, friend.tech tokenizes social influence, turning users into tradable commodities based on supply and demand dynamics. The platform airdropped its token, \$FRIEND, on May 2024, and announced the V2 iteration of the platform, which features Money Hub, which provide users with an exclusive space for financial discussions and networking, and a native DEX.

Figure 10: Aerodrome experienced a significant growth in TVL in 2024



Source: DeFiLlama, as of August 22, 2024

Additionally, in June 2024, Coinbase introduced the [Coinbase Smart Wallet](#), an initiative designed to streamline the onboarding process for users entering the on-chain ecosystem. This wallet supports multiple blockchains, including Base, Arbitrum, Optimism, Ethereum, and more, enabling users to manage assets across various platforms through a web-based app. It also integrates with major applications and employs biometric authentication methods,

such as Face ID and passkeys, to ensure secure onboarding. As CEX-based wallet has become a popular tool for retail users navigating the on-chain ecosystem, combined with Coinbase's established user base and strong brand presence, this new feature could serve as a significant catalyst for Base's future user growth.

3.4 Blast

Blast has emerged as a prominent player in the Layer 2 landscape this year, with its rapid growth largely driven by a highly anticipated phase 1 airdrop event. This event attracted over US\$2B in TVL at its peak, as market participants sought to capitalize on the yield opportunities it presented. **The anticipation surrounding Blast's airdrop was fueled by a successful marketing strategy, the strong reputation of the Blur NFT team for delivering reliable products, and backing from Paradigm, a Tier-1 venture capital firm, all of which heightened market sentiment.**

Announced in June 2024, Blast's phase 1 airdrop allocated 17% of the total \$BLAST supply, with 7% distributed to users who bridged funds to Blast, 7% to those who interacted with Blast dApps, and 3% to the Blur Foundation. **Following the phase 1 airdrop, Blast's TVL experienced a notable correction, despite the team's announcement of a continued incentive program, signaling a decline in user interest toward the chain.**

In addition to the phase 2 airdrop announcement, the Blast team introduced a new strategic direction, termed 'The Fullstack Chain.' In a blog post titled '[Blast Vision](#),' the team noted that existing blockchains typically offer a similar end-to-end user experience, focusing on optimizing the chain itself while relying on third parties for other aspects of the stack. They likened this approach to Android's model, which, while functional, leads to a fragmented and friction-filled ecosystem. In contrast, Blast aims to adopt a fullstack approach, akin to Apple's model, by building everything from software to hardware in-house.

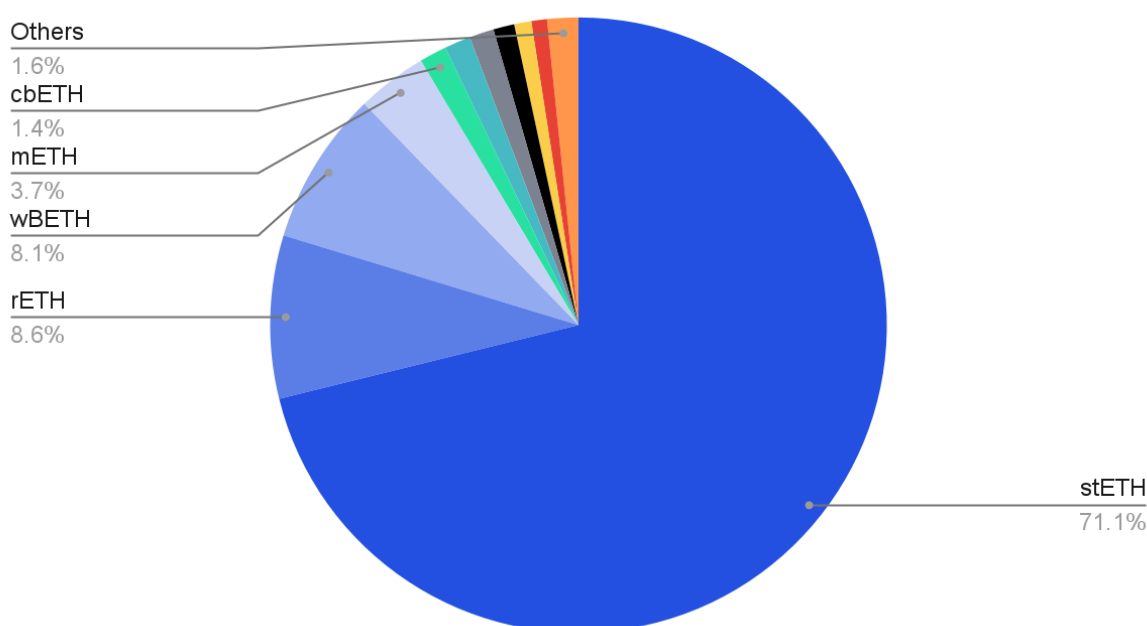
To realize this vision, the team mentioned that in phase 2, the Blast Foundation will collaborate with the community to develop a desktop and mobile wallet, specifically tailored for crypto natives. The goal is to create an experience that significantly surpasses that of MetaMask, with incentives designed to accelerate adoption.

3.5 Mantle

Mantle is a Layer 2 network that utilizes a modular architecture, combining the OP Stack technology with a data availability solution derived from Eigen DA. It is recognized for having one of the largest protocol treasuries, approximately US\$2.4 billion, and an ecosystem that offers various yield opportunities for its users. **The Mantle team is adept at orchestrating**

DeFi initiatives to boost user engagement and participation within its ecosystem. Notable examples include Mantle Staked ETH (\$mETH), the fourth-largest liquid staking ETH, the [Mantle Reward Station](#), which allows \$MNT lockers to earn a variety of reward, and [Methamorphosis](#), a recently launched incentive program for \$cmETH, Mantle's upcoming liquid restaking token. Moreover, \$MNT can also be used in Bybit's launchpool events. **These initiatives provide \$MNT holders with multiple avenues to participate and earn yield, giving \$MNT a stronger utility compared to other L2 tokens, which are often limited to governance functions.** This enhanced utility partly explains why \$MNT's market cap is comparable to that of \$ARB, the native token of the largest L2 project.

Figure 11: mETH is the 4th largest ETH liquid staking token



Recently, Mantle announced a [rebranding](#) of its Liquidity Staking Protocol (Mantle LSP), which facilitates the operation of \$mETH. As Mantle rolls out \$cmETH, the team decided to leverage the existing recognition of \$mETH by renaming the Mantle LSP to the mETH Protocol. The mETH Protocol consists of three products: \$mETH, \$cmETH, and \$COOK, the governance token for the mETH Protocol.

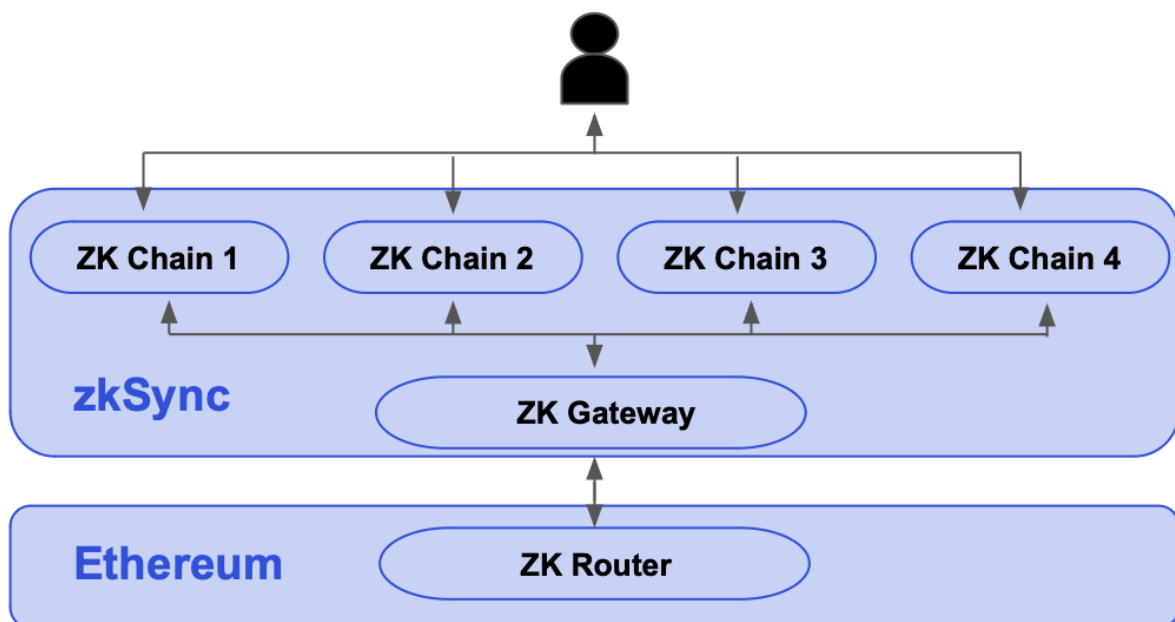
3.6 zkSync Era

In addition to its token airdrop in June 2024, another significant development for zkSync in 2024 was the introduction of the '[Elastic Chain](#)' concept in July. The Elastic Chain is a core component of zkSync 3.0, marking a transformation from a single Layer 2 solution into a

network of ZK chains built with the [ZK Stack](#), all unified under the Elastic Chain architecture to enhance user experience.

At a high level, the Elastic Chain consists of three key components^[2]:

- **ZK Router:** A series of smart contracts on Ethereum responsible for managing the state of the network, handling chain registrations, facilitating critical interactions, and maintaining shared liquidity across the network.
- **ZK Gateway:** The middleware between Ethereum and the ZK Chains, facilitating interoperability operations between ZK Chains.
- **ZK Chains:** Customizable rollups, validiums, or volitions built using the ZK Stack framework, interconnected through the ZK Gateway and the L1 smart contracts.



This architectural innovation is designed to significantly improve the user experience by creating a more seamless and interconnected network of ZK chains.

3.7 Starknet

Starknet is a permissionless ZK rollup for Ethereum. Earlier this year, Starknet released its [2024 roadmap](#), which emphasizes enhancing performance and reducing fees. **Two significant upgrades slated for the near future are transaction parallelization and Cairo-native integration^[3].** Transaction parallelization, scheduled for Starknet's V0.13.2, will enable the concurrent execution of independent transactions, allowing Starknet to process a higher volume of transactions simultaneously. This will result in improved throughput and faster finality. Cairo-native integration, planned for Starknet's V0.13.3, will incorporate the

advanced Cairo Native project by LambdaClass into the Starknet sequencer, with the goal of accelerating transaction execution, reducing latency, and increasing throughput.

Table 2: The timeline and objectives of Starknet’s 2024 roadmap

Version	When	What
v0.13.0	Live on mainnet	V3 transactions
v0.13.1	Live on mainnet	Support for EIP-4844 Stability
v0.13.2	Q2 2024	Transaction parallelization
v0.13.3	Q3 2024	Cairo-native integration
v0.14.0	Q4 2024	TBD from the following: • Volitio • Applicative recursion • DA compression

Source: Starknet

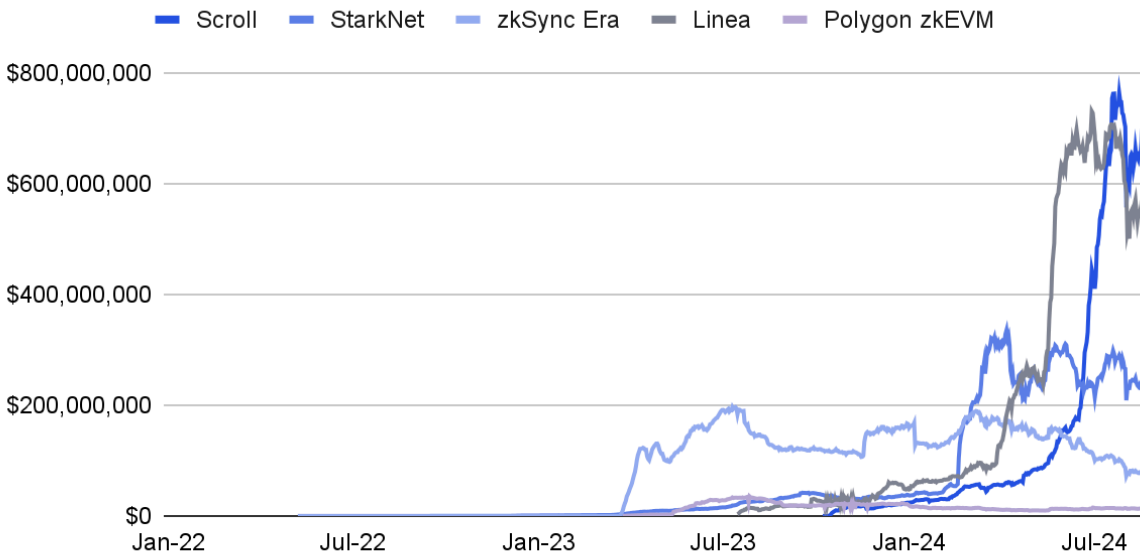
In addition to these technical advancements, **Starknet is also the first ZK rollup to launch its native token.** The Starknet airdrop took place in February 2024, distributing over 700 million \$STRK tokens to nearly 1.3 million wallets. The \$STRK token has multiple use cases, including paying network fees, participating in governance, and staking, which will become available in Q4 2024.

3.8 Scroll

Launched in October 2023, Scroll is a zkEVM Layer 2 solution for Ethereum. **Notably, it is now the largest ZK rollup by TVL, surpassing established projects like zkSync and Starknet. The disparity in TVL between Scroll and projects like zkSync and Starknet is likely driven by user activity related to airdrop farming.** As ZK rollups are still in their early stages, most lack a robust on-chain ecosystem. Consequently, a significant portion of the activity on these chains is inorganic, driven by users seeking to farm potential token rewards. This tendency for users to migrate to the next chain following a token launch is evident in the TVL trends, where the declines in TVL for zkSync and Starknet coincided with the upward TVL trend for Scroll and Linea, both of which have yet to launch their tokens.

Additionally, Scroll's loyalty program, [Scroll Sessions](#), has also contributed to its TVL growth. Introduced in May 2024, the program rewards community members with Scroll Marks for their participation and engagement within the Scroll ecosystem. Users can earn Scroll Marks by bridging assets to Scroll or interacting with Scroll dApps. The team also announced a retroactive allocation of Scroll Marks for members who have deployed assets on Scroll since October 10, 2023, the date of the Scroll Mainnet genesis block.

Figure 13: Scroll is the largest zkEVM L2 by TVL



Source: Artemis, as of August 22, 2024

3.9 Linea

Linea is another zkEVM Layer 2 solution that has experienced significant growth since 2024. **Similar to Scroll, Linea's growth has been largely driven by airdrop farming activity.** Linea's incentive program, '[Linea Surge](#),' launched in May 2024, has played a key role in this expansion. The program is set to run for six months and is divided into six distinct 'Volts,' one for each month, rewarding users for maintaining assets on Linea and providing bonuses for deploying those assets into partner protocols. **To promote balanced adoption across the Linea ecosystem, the program includes dynamic rules for point allocation, with different weightings for various verticals and asset classes,** thereby preventing liquidity concentration in specific areas and contributing to the healthy growth of the Linea ecosystem. Currently, Linea Surge is in Volt 4, which offers higher rewards for stablecoin liquidity compared to other asset classes. Based on growth metrics so far, Linea Surge has been successful, but the key challenge will be to track whether Linea's robust activity can be sustained once the program concludes later this year.

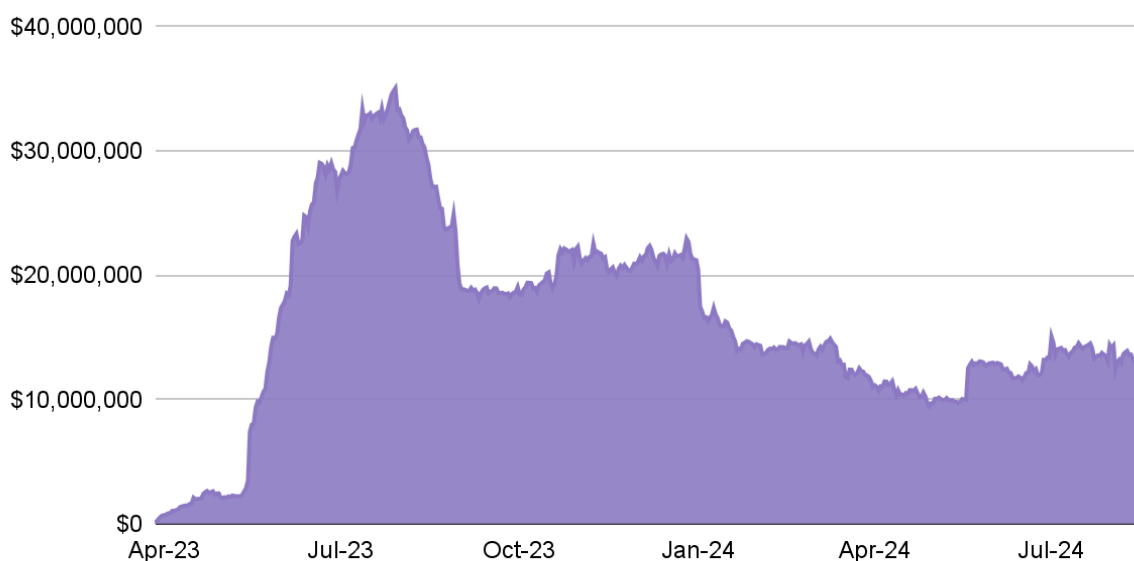
3.10 Polygon zkEVM

Launched in March 2023, Polygon zkEVM is Polygon's zkEVM Layer 2 solution. In February 2024, it successfully underwent the Etrog Upgrade, advancing the network to nearly a full Type 2 ZK-EVM. This upgrade allows Ethereum developers to redeploy their existing code

and smart contracts on Polygon zkEVM without the need for auditing or modifications, offering a seamless transition from Ethereum.

Currently, Polygon zkEVM has around \$15 million in TVL, with its largest protocols being DEXes such as QuickSwap, Uniswap V3, and Balancer V2, along with lending protocols like Dolomite and PancakeSwap, and liquidity management platforms such as ICHI and Gamma. While Polygon zkEVM has established a presence, it currently lags behind its peers in terms of ecosystem robustness, indicating room for growth and development.

Figure 14: Polygon zkEVM is currently sitting at US\$15M in TVL



Source: Artemis, as of August 22, 2024

4. Key Developments to Watch

In this section, we discuss some of the critical developments that could shape the ongoing trajectory of the L2 landscape.

Progression of the native interoperability of the L2 ecosystem: With the growing usage of Optimism's OP Stack and zkSync's ZK Stack, **these Layer 2 networks are recognizing that despite increasing adoption, the user experience may be suboptimal due to the fragmentation of assets and applications across multiple chains.** To address this, both the Optimism and ZK communities have introduced solutions aimed at enhancing user experience within the Ethereum L2 ecosystem. Optimism's approach is the Superchain, which includes a message-passing protocol, the Superchain token standard, and interoperability fault proofs^[4] to improve the connectivity between chains built using the OP Stack. Conversely, zkSync has introduced the Elastic Chain, designed to give users the

experience of interacting with a single chain while navigating various ZK Stack-based chains. Additionally, Polygon has unveiled AggLayer, which employs a unified bridge and zk proofs to create an aggregation layer across different chains.

A significant number of projects have already expressed interest in adopting these interoperability solutions. Monitoring the progress of these initiatives is crucial for ensuring the continued appeal of the L2 ecosystem and for assessing which L2 networks will lead the market in the coming months and years.

The growing presence of Based rollup: A Based rollup is a type of rollup where transaction sequencing is performed by the L1 blockchain. Although the concept of Based rollups can be dated back to several years ago, it wasn't widely embraced until March 2024, when it gained renewed attention. **Because the transaction sequencing of Based rollups is done by L1, they inherit the liveness and decentralization of the base layer and are more economically aligned with the L1.** This makes them a potentially superior solution compared to existing Layer 2s, where transaction sequencing is often centralized. Taiko, an Ethereum-equivalent (Type 1) ZK-EVM Layer 2, is the first rollup project to adopt this framework. Its transaction sequencing is handled by Ethereum validators, allowing it to inherit Ethereum's liveness and credible neutrality.

The centralization of sequencers has long been a point of criticism for existing L2s. **Although many projects have included sequencer decentralization in their roadmaps, progress has been slow.** Based rollups offer a promising solution to this issue. As a relatively new concept, the design of Based rollups will require further exploration and experimentation. It is expected that more projects will begin to explore this approach, leading to increased discussion and development in this area.

The evolving of fraud-proof mechanisms: As Layer 2 solutions continue to mature, the development of robust fraud-proof systems remains a critical focus for optimistic rollups. Recent advancements in this area demonstrate a shift towards more sophisticated and efficient mechanisms, balancing the intricate trade-offs between security, speed, and decentralization.

Projects like Arbitrum and Optimism are at the forefront of this evolution. Arbitrum's new BoLD (Bounded Lifetime for Disputes) protocol and Optimism's Fault Proof system (OPFP) represent significant strides in addressing longstanding challenges such as resource exhaustion attacks and settlement delays^[5]. These innovations aim to enhance the economic security of rollups while maintaining their scalability advantages.

Concurrently, alternative approaches like Cartesi's Permissionless Refereed Tournaments are exploring novel ways to structure fraud-proof games, offering alternative approaches to improve the fraud-proof system.

The ongoing refinement of these mechanisms is likely to play a crucial role in the broader adoption of optimistic rollups. As these systems evolve, they continue to navigate the delicate balance between optimizing for safety, promptness, and decentralization – a trilemma that defines much of the current research and development in this space.

5. Closing Thoughts

Over years of development, L2 projects have become a cornerstone of the on-chain ecosystem, offering users affordable transaction costs. Surveying the current landscape, Optimistic rollups, which hold a market dominance of 80%, continue to lead with broader adoption and a larger user base. Among these, Base has gained significant prominence in 2024, driven by meme coin activity and notable traction through SocialFi applications. Blast is another notable contender, attracting substantial market attention through its successful marketing strategies and yield offerings.

Although ZK rollups continue to trail behind their Optimistic counterparts in terms of network metrics, they have had an eventful 2024 so far. The airdrops of zkSync and Starknet marked important milestones for these two heavyweight ZK projects. Other projects, such as Scroll and Linea, also experienced commendable growth, fueled by their ongoing incentive programs. Monitoring whether this momentum can be sustained will be a key indicator of their future success.

Looking ahead, L2 projects still have ample room for growth. The accelerating development of native interoperability solutions could further enhance user experience, attracting more adoption to these networks. Novel concepts like the Based rollup and the evolving fraud-proof mechanisms are also significant. Despite the stagnant performance of L2 tokens, these projects have proven their importance within the crypto industry, and their future potential remains optimistic.

References

1. <https://medium.com/offchainlabs/your-chain-your-rules-offchain-labs-technical-roadmap-to-fuel-arbitrum-innovation-f787f2e85966>
2. <https://zksync.mirror.xyz/BqdsMuLluf6AlWBgWOKoa587eQcFZq20zTf7dYblxsU>
3. <https://www.starknet.io/blog/starknets-roadmap/>
4. <https://blog.oplabs.co/solving-interoperability-for-the-superchain-and-beyond/>
5. <https://medium.com/l2beat/fraud-proof-wars-b0cb4d0f452a>

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