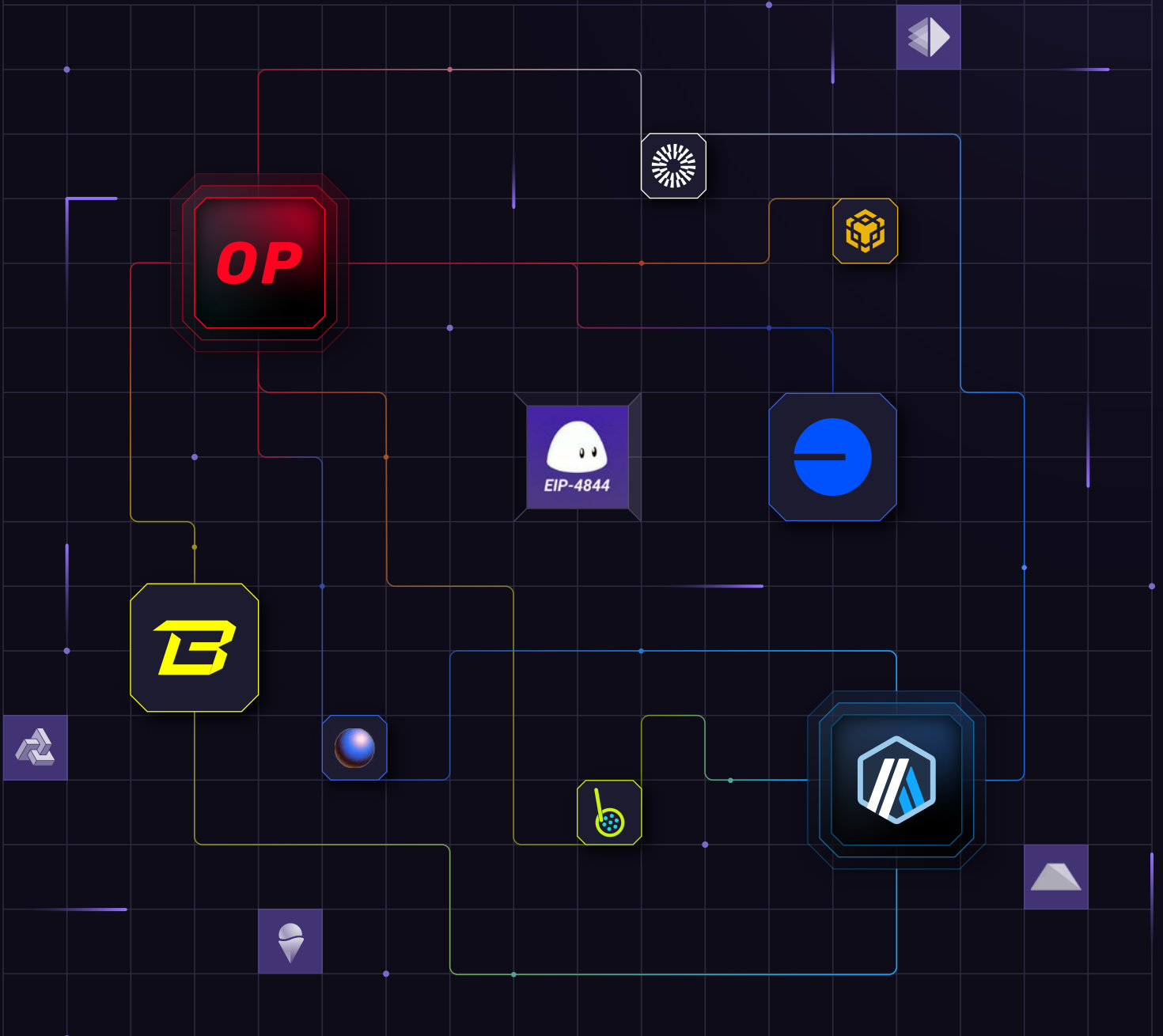


Optimistic Rollup Network Report

A Q1 2024 overview of
optimistic trends



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Executive summary

Key report findings

1. Optimistic rollups have achieved significant growth in on-chain activity, with a **10x increase in total TVL and over 200% increase in TPS** since the start of 2023, establishing themselves as the leading Ethereum and ecosystem scaling solution.
2. Dencun upgrade (EIP-4844) brought numerous technical improvements and better user experience by **reducing transaction costs by 90-98%** on all optimistic rollups, making room for a new wave of users.
3. Arbitrum and Optimism have retained their **first-mover and leading positions through innovative infrastructure solutions**, opening the space to the proliferation of new Layer 2 networks.
4. Emerging L2 solutions such as Base and Blast have achieved **fast growth in various on-chain metrics** before and after the Dencun upgrade. Base surpassed other optimistic rollups in the number of daily transactions, crossing 2M, while Blast's DeFi TVL spiked past \$1B in the shortest amount of time.
5. Tooling and infrastructure availability on rollups listed in the report points to their **developing ecosystems**. However, there are some differences between the networks, with most of the tooling available on Arbitrum, Optimism, and Base compared to newly launched optimistic rollups.
6. Rollup frameworks and tech stacks enable far **easier Layer 2 network deployment and maintenance**, as well as greater interoperability and composability between chains. RaaS providers are emerging as key network and tooling partners, offering their expertise and support in rollup launching, maintenance, and scaling.
7. **A growing number of new rollup networks** is being launched, from general-purpose to application-specific ones, with 10+ new optimistic rollups launched using optimistic tech stacks.

Executive summary

The Optimistic Rollup Network Report provides an overview of optimistic rollups, analyzing on-chain activity and key trends that bolster the rollup movement to Ethereum scalability. Overall, rollups are at the core of Ethereum's roadmap, prevailing as the dominant solution to the scalability challenge of the blockchain trilemma.

Over time, this only became more apparent given the surge in usage, number of applications, and network developments, leading the Ethereum development community to dedicate resources in this direction.

The ecosystem upgrades

The Merge has set the stage for the modular, multichain thesis with Ethereum as the base layer. The recent success of the latest Dencun upgrade (EIP-4844) is another confirmation of the Ethereum Foundation's and community's dedication to the rollup-centric future. The upgrade is the first to address the question of scalability indirectly by increasing the throughput and lowering fees primarily for Layer 2 rollup networks.

The optimistic direction

Layer 2 solutions, in general, were the fastest growing sector in 2023, establishing product-market fit and increasing the total value locked by 321.3%, according to [Binance Research](#). Optimistic rollups accrued a substantial portion of the total TVL of all Layer 2 solutions, totalling over 80% or \$30B by the end of the year. They were and remain to be the primary channel for onboarding new users due to their far more competitive transaction costs.

However, it is not solely the incredible metrics these networks have achieved. The narrative that Layer 2 networks are the solution and primary direction for scaling Ethereum, with optimistic rollups leading the way, is strongly affirmed.

The two leading optimistic rollups, Optimism and Arbitrum, gained most of the attention from projects and, in turn, the community and users. After announcing plans for the Superchain, a network of chains on the OP stack, and Arbitrum Orbit, a universe of chains, Optimism and Arbitrum began establishing the foundation and infrastructure for projects and developers to launch dedicated chains, helping further scale the Ethereum ecosystem.

The rise of RaaS

The technology and infrastructure are sound, and innovation is abound. Leading rollup frameworks and Rollup-as-a-Service (RaaS) providers are tackling hard problems as numerous teams launch their own use-case or application-specific

Layer 2 networks. With the low post-Dencun fees and higher throughput, DAU and transaction numbers are already increasing. The stage is being set for the next wave of adoption.

The importance of optimistic rollups for scaling Ethereum

Ethereum remains the most publicly accessible, decentralized, and secure blockchain platform to date. It's also the **primary production network** in the entire blockchain ecosystem. **71% of contracts** are initially deployed on Ethereum, the number of developers is **2.7x larger** than the next biggest ecosystem, and most contract logic originates from Ethereum, according to [Electric Capital Report](#). Yet, the sudden growth in usage and number of applications led to network congestion and high traffic, driving up its cost. Therefore, the question of scalability remains the key challenge in the blockchain trilemma.

The rollup-centric approach has asserted its dominance as the most effective and secure way to scale Ethereum. Rollups' appeal lies in their affordability, easy deployment, and EVM-equivalent nature. Additionally, at the end of 2020, [Vitalik announced](#) that *"the Ethereum ecosystem is likely to be all-in on rollups as a scaling strategy for the near and mid-term future,"* sparking a proliferation of teams experimenting with different implementations, including optimistic, zero-knowledge, and STARK-based rollups.

Aside from the first-mover advantage, optimistic rollups have struck a balance by providing high throughput and comparatively low costs while inheriting enough security from the parent chain. Additionally, as a part of the multichain ecosystem, they're natively modular. By serving as the execution layer for processing transactions, rollups have a major impact on the ecosystem:

- 1. Scalability and efficiency:** As a dedicated layer for transaction execution, rollups increased throughput by several orders of magnitude, addressing the Ethereum network's primary challenge.
- 2. Lower transaction costs:** Bundling a large number of transactions into a single one reduces overall gas costs and makes them more affordable to the end user, especially after the Dencun upgrade.
- 3. Better user experience:** By processing transactions faster and lowering user fees, they improve user experience, which is crucial for mass adoption.
- 4. Faster deployment of new chains:** Thanks to the flexibility of the rollup stack and other specialized modular components, teams can deploy general-purpose and specialized, app-specific rollups faster.
- 5. Greater innovation and growth:** In the modular system, rollups are independent from other layers, enabling easier chain upgrades and optimizations, as well as the development of new, innovative applications.

Report overview

The Q1 2024 Optimistic Rollup Network Report outlines the essential data demonstrating the dominance and on-chain activity of the leading optimistic rollup networks: Arbitrum, Optimism, Base, Blast, opBNB, Mantle, Zora, and Boba. The criteria for choosing the networks were based on the activity data from the previous year and the first quarter of 2024.

Of particular importance is the initial effect of the Dencun upgrade on these networks and how it additionally bolsters the optimistic rollups' appeal. Longer-term effects are expected by the end of the year.

The report further explores the creation of rollup frameworks and the surge in RaaS providers, enabling easy deployment of blockchain networks alongside infrastructure and development services.

Finally, the report showcases several essential Web3 developer tools and infrastructure providers, offering further insight into the most developed optimistic rollup networks. As was the case in the [2023 EVM Network Landscape Report](#), tooling availability is one of the key indicators of a growing network necessary to accommodate developers' needs.

Report goals

The report aims to highlight the confluence of factors contributing to the general appeal of optimistic rollups as the currently leading solution to scaling Ethereum, with a data-backed approach and analysis of the current on-chain and off-chain trends on these networks.

Furthermore, the report produces detailed information on the availability of the essential developer tools and infrastructure components that support the leading optimistic rollups and enable the creation of new ones. The presence and activity of these signal the maturity of featured optimistic rollups but can also serve as a basis and provide some insights to developers and teams looking to spin up their own optimistic rollup Layer 2 networks or appchains.

Finally, the report is a small contribution to the ongoing community and partnership initiatives among the leading Web3 teams. The joint efforts aim to provide more accessible, enabling, and streamlined development environments for Web3 incumbents, builders, and teams looking to enter the Web3 ecosystem.

Criteria and methodology

There are significant differences between the optimistic rollup networks included in the report. It's important to highlight that not all included chains target the same total addressable market.

Aside from including the first-movers and market leaders such as Arbitrum and Optimism, the report also lists emerging chains launched in 2023. These chains

managed to find the product-market fit, catering to the leading infrastructure providers and developer tools. They also attracted a significant number of projects and an even greater number of users.

In that regard, not all optimistic rollups can be treated equally. Alongside the general-purpose ecosystems, some are launched for a specific purpose derived from their business development approaches, such as opBNB and Base, or a decision to address a specific use case, as in the case of Zora or Blast.

The report analyzes various on-chain metrics such as TVL, amount of tokens bridged to a chain, number of active users, total number of transactions submitted to Mainnet, transaction execution time compared to Mainnet, transaction costs compared to Mainnet, and gas savings compared to Mainnet. It also considers the number of the most used protocols or projects, as well as the upcoming projects and some Tenderly-specific data.

The on-chain data presented in this report exemplifies the strengths of these networks and how these, help the community's general mission to scale the Ethereum ecosystem. The data also highlights the impact of the latest Dencun upgrade. Some of the data sources include reputable platforms such as **Dune**, **L2BEAT**, **DefiLlama**, and **growthepie**.

It's important to note that L2BEAT and DefiLlama use different methodologies for calculating the Total Value Locked (TVL) metric. DefiLlama, in line with its focus, tracks assets actively engaged in dapps on specific networks as TVL, while having a separate bridged TVL metric. L2BEAT, on the other hand, tracks TVL as the sum of canonically bridged, externally bridged, and natively minted assets (e.g. L2-native governance tokens like ARB and OP). To accurately present all the data, we relied on the TVL from DefiLlama, unless it's emphasized that L2BEAT data is mentioned.

Legal disclaimer

This report contains data for informational purposes only and is not intended to provide financial or legal advice. The information is based on our internal sources and network analysis. However, it also contains information collected from publicly available resources for which we cannot guarantee completeness or accuracy. We strongly advise you to conduct your analysis and research as this report does not assure any future results or performance.

→ Chapter 02

The growth of optimistic rollups

Optimistic rollups have witnessed substantial growth in 2023, with multiple new networks and tech stacks being launched. They led the entire rollup market, with Arbitrum and Optimism accounting for 80% of the total TVL.

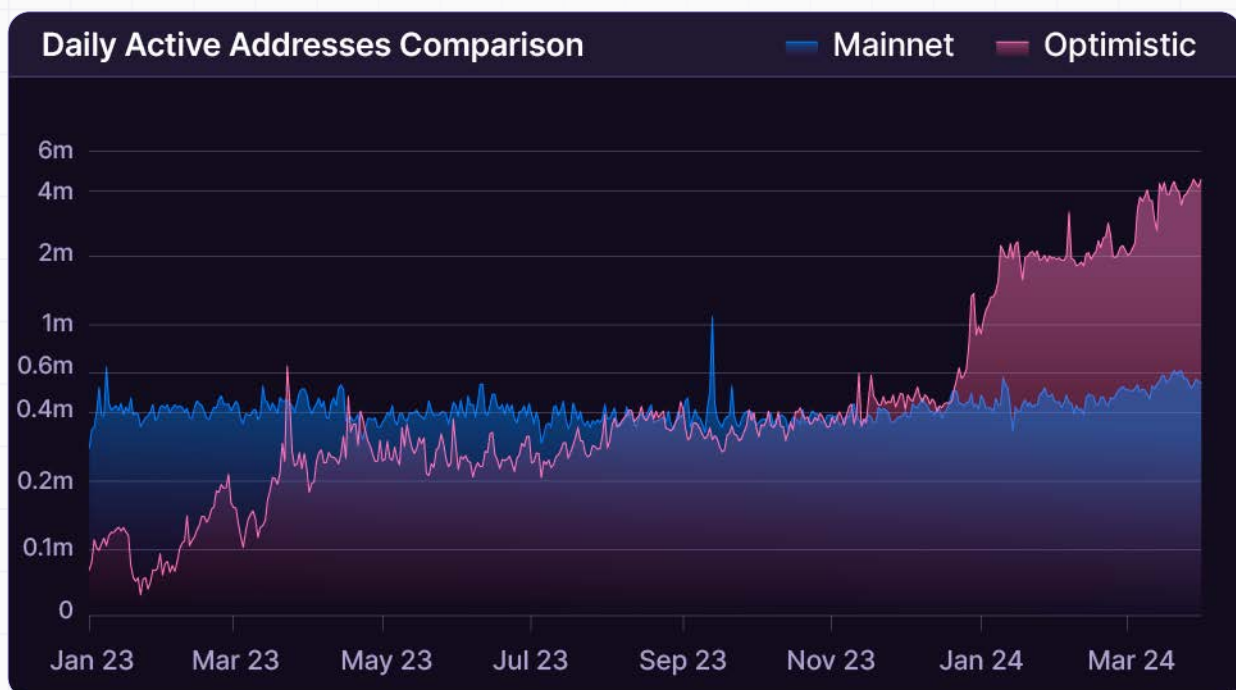
Additionally, rollups have seen comparatively strong growth after the Dencun upgrade in the number of active addresses and transaction count. Over the course of 2023, the aggregate increase in TVL was from \$4B to \$17B.

Key Optimistic Rollup Data

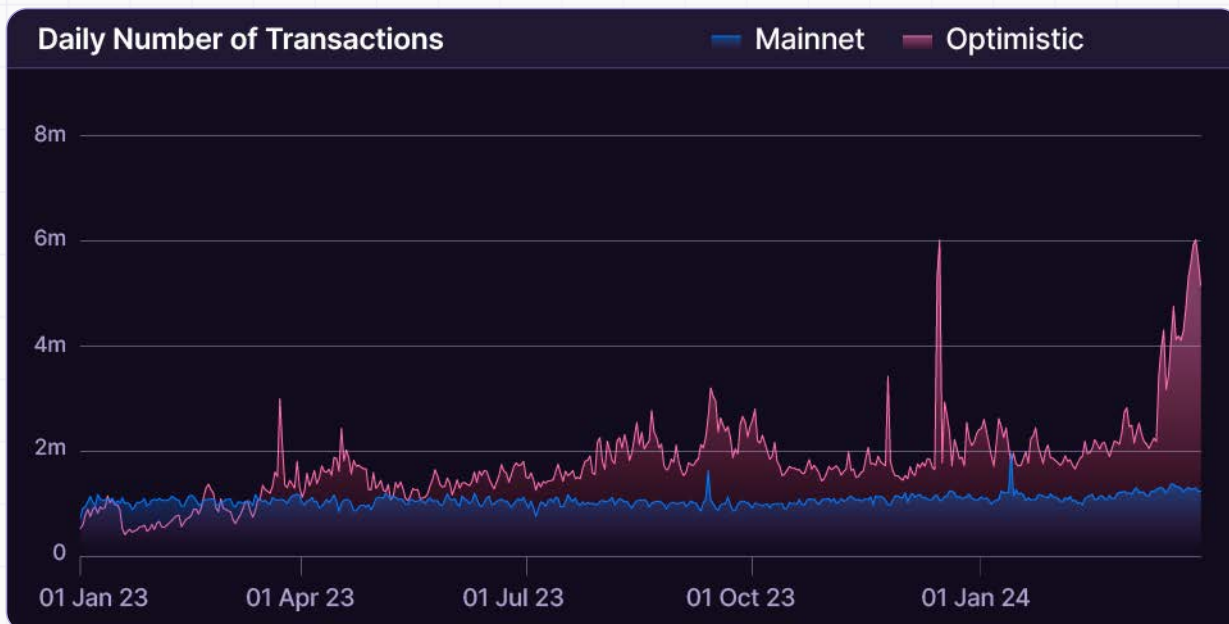
A consistent throughput increase, or number of transactions per second (TPS), made all rollups far more attractive for dapp deployment to developers than the Ethereum Mainnet. At the end of 2023, optimistic rollups averaged higher TPS than Ethereum at ~20, achieving a peak of 64.7, while Ethereum held steady in the range of 12-13, according to [L2BEAT data](#).

The public goods company providing transparent on-chain data coined an interesting metric – L2 scaling factor. This factor measures the increase in transactions attributable to L2 solutions or the number of transactions that would not be possible without these solutions. The number is fairly higher when taking into account all types of rollups at 9.82x, yet when looking solely into optimistic rollups, it stands at 3.97x. L2BEAT observes this metric over the last 7 days (end of March 2024).

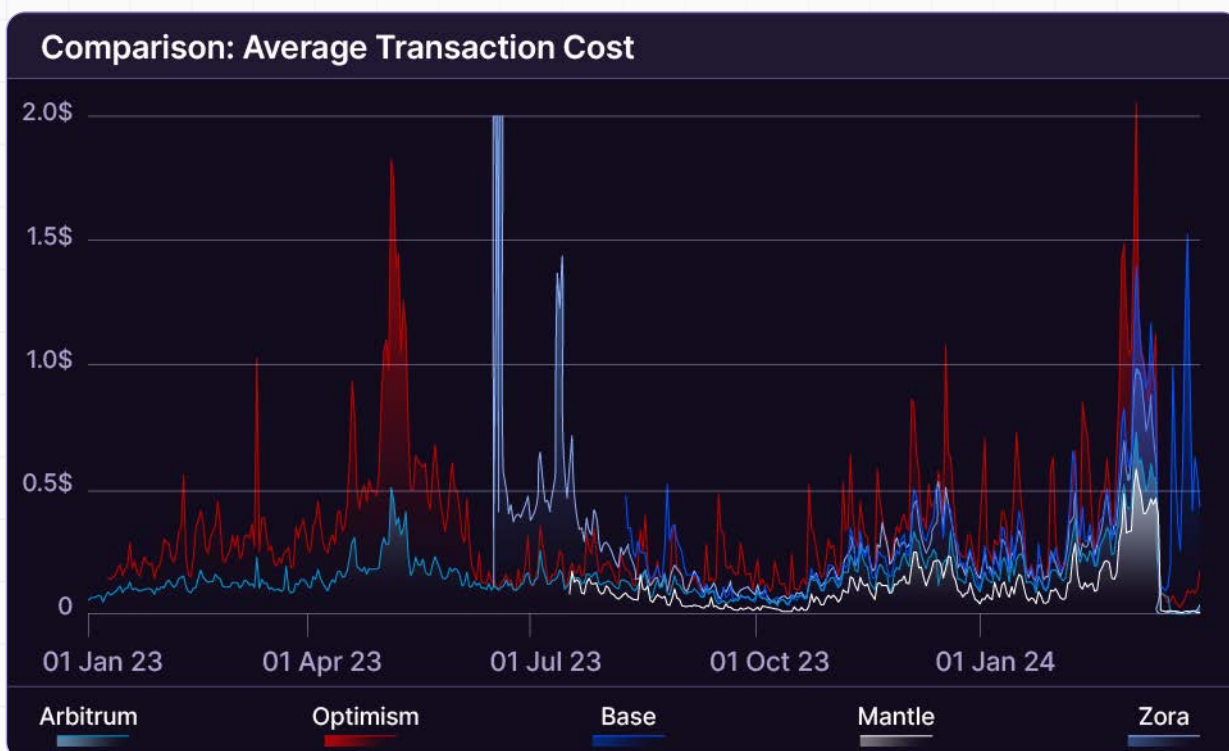
Daily active addresses comparison: The data clearly shows stable and consistent growth in the number of active addresses on optimistic rollups compared to the Ethereum Mainnet. As new users enter the space, they opt for lower fees offered by these networks. 2023 seems to be a turning point, coinciding with developer and user incentive campaigns, crucial technical upgrades, and new rollup network launches.



Daily number of transactions: With the increasing number of users relying on Layer 2 solutions, the number of transactions on these networks is evidently rising. Again, considering new incentive campaigns, token launches, and rollup launches, Layer 2 networks seem to be indeed scaling the Ethereum ecosystem.



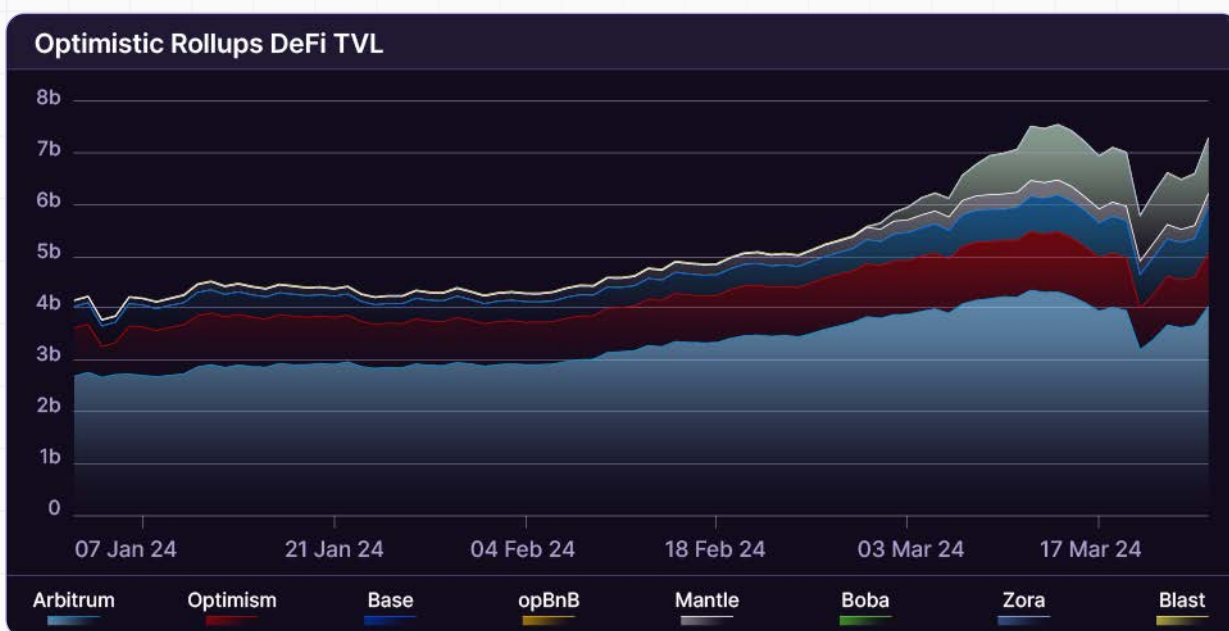
Average transaction cost: The cost of transacting on Ethereum greatly varies and remains one of the network’s critical issues. On the other hand, fees on optimistic rollups are considerably lower and are their primary appeal. As usage grew, so did the cost of transacting on these networks. The Dencun upgrade made a critical contribution to fee reduction.



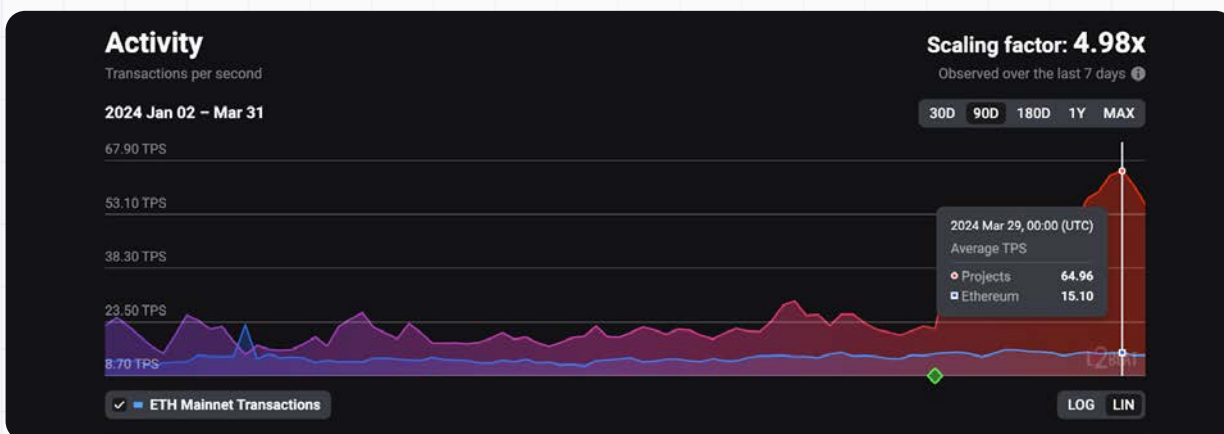
Q1 aggregate data

The Q1 of 2024 followed suit and doubled the **sector's total TVL, reaching \$40B at the end of March** from \$20B at the end of December 2023, according to the L2BEAT methodology. The market entered a new phase spurred by recent developments in the overall Web3 ecosystem and the correlation with general solid market movements. In this period, **optimistic rollups captured the largest TVL among the other Layer 2 solutions, totalling \$30B** at the March peak.

Arbitrum and Optimism continued to lead the pack, witnessing increases from \$9.4B and \$6.1B to \$17B and \$8B, respectively. The aggregate DeFi TVL across optimistic rollups also nearly doubled in Q1 of 2024, going from \$4.2B to \$8B according to DefiLlama data.



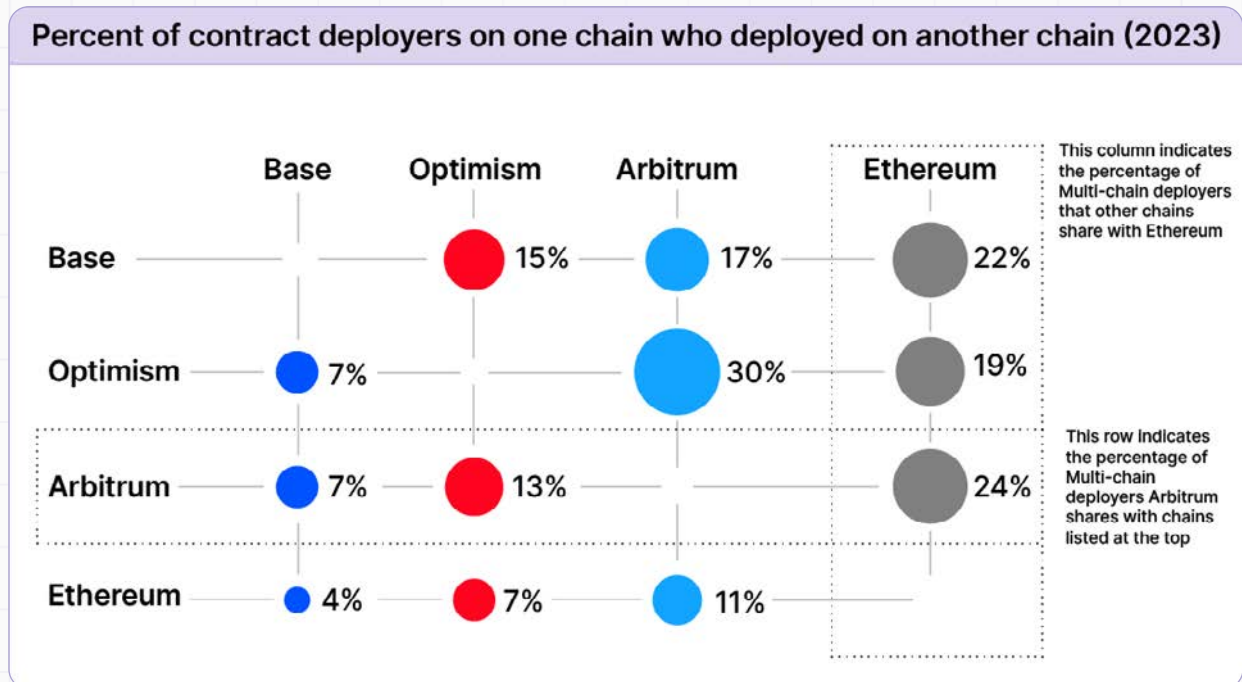
Comparing the **TPS** between optimistic rollups and Ethereum in the first quarter puts the metric at a similar value with Ethereum, moving between 12-14, while optimistic rollups averaged 17-25. As the biggest benefactor of the Dencun upgrade, the metric clearly indicates its success, with Ethereum continuing to average 14-15, all the while **optimistic rollups saw an increase to the 30-58 range**.



Source: L2BEAT, Optimistic Rollup Activity

Number of developers, deployed contracts, and transaction wallets in Q1

The [Electric Capital Developer Report 2023](#) showcased that the multichain narrative is evident in the number of developers contributing to more than one chain across the ecosystem. Going beyond that, Ethereum shares developers with most other chains in the ecosystem, or EVM-compatible chains share developers with other EVM chains, confirming that Ethereum is the primary production chain. Moreover, Ethereum shares the greatest number of developers with optimistic rollups (specifically Arbitrum, Optimism, and opBNB) and Polygon.



Source: Electric Capital, 2023 Developer Report

The report further outlines that **Ethereum is the biggest exporter of new on-chain logic**, meaning that most developers first deploy to Ethereum and then to other chains - *“most of the contract logic on L2s originated from Ethereum”*.

The first-mover advantage and the launch of rollup frameworks

Several key developments propelled optimistic rollups over the previous year, with signs of greater development and adoption. The primary “optimistic duo” managed to maintain their lead even as the first long-awaited and promising zk-rollups were launched, with a constant increase in TVL, the average TPS, and daily active addresses while retaining the appeal among projects and developers.

Also, according to the previously mentioned [Binance Research Report](#), it’s worth noting that rollups have mostly eaten away at the usage of other Layer 1 networks instead of making any significant dent in Ethereum’s usage.

Arbitrum

Arbitrum established itself as the leading rollup and one of the top five blockchain networks thanks to its great product upgrades, growing dapp ecosystem, and several user engagement campaigns. The first important moment happened a year ago, in March 2023, with the **launch of the \$ARB token airdrop**, its native governance token.

Throughout the year, Arbitrum DAO kickstarted various incentive programs, such as the **Arbitrum Odyssey**, an eight-week user-engagement program that drew nearly 100k new users and heavily engaged with the existing ones. Arbitrum subsequently launched its **Short-Term Incentive Program (STIP)** to further engage with its user base and dapps and advance usage and development.

Additionally, Arbitrum DAO allocated over 71.4M ARB tokens to leading projects based on user activity. It led to a surge in user activity, especially for the leading DEX and derivative projects, the largest gas consumers on the network.

Lastly, following Arbitrum's [complete migration to the Nitro stack](#), in March of 2023, Arbitrum also announced the launch of **Arbitrum Orbit**, a permissionless solution for any developer to build a Layer 3 (L3) blockchain using Arbitrum technology. The new vision for the next generation of rollups was based on the idea of a system of interconnected networks, providing developers with greater flexibility and autonomy when launching their application-specific networks.

The key feature is the ability to rely on **Arbitrum Stylus**, a programming environment that enables developers to write smart contracts using familiar Web2 languages such as Rust, C, and C++. Although still in the early stages of development, it opens possibilities for new developers to enter the space, helping further scale the ecosystem.

Optimism

Announced some time ago, Optimism's **Superchain vision** based on the **OP stack**, a standardized and open-source development stack, provides another rollup framework that achieved significant strides in the previous year, continuing into Q1 of this year. The ease of deployment, open-source access, and technical compatibility attracted both general-purpose Layer 2 networks like Coinbase's Base and Mode, as well as application-specific ones like Zora, Aevo, and Lyra, to launch using the OP stack.

Like Arbitrum's Nitro upgrade, Optimism's upgrade to **Bedrock** introduced significant user experience improvements, including reduced transaction costs and smart contract deployment fees. These improvements appealed to a large developer pool and encouraged them to use the OP stack.

In Optimism's vision, Superchain presents a unified network of chains built on the OP stack. The Superchain provides seamless integration and interoperability between the OP chains, sharing security, bridging, message-passing infrastructure,

and governance. The key element of this scaling vision is the reliance on and **partnership with the leading RaaS providers**, such as Conduit and several others.

Optimism also had its own development-centric campaigns, like the **Retroactive Public Goods Funding (RetroPGF)** initiative, which started in 2021. The campaign had two more rounds last year, **allocating 40M \$OP governance tokens** to builders, creators, and educators of public goods. *RetroPGF has awarded 643 projects in categories that spanned infrastructure to education, governance to the OP Stack, and the developer ecosystem to the end user experience.*

The major announcement occurred in February, 2023, when Coinbase announced the launch of their Layer 2 blockchain network, **Base**, using the OP stack. The move by the centralized exchange was the catalyst for Optimism's Superchain vision, OP stack, and RaaS collaborations. The on-chain/off-chain partnership was multidimensional through the profit-sharing model's financial, social, and technical aspects.

Tech-stack-based success

The success of Base cannot be overstated. It's the first prominent L2 built using one of the two tech stacks, offering a typical, frictionless on-chain experience while fully and seamlessly integrating into Coinbase's products. It was announced in February last year and launched in August.

Since its launch, the general-purpose network has grown strongly, plateauing by the end of the previous year. It steadily crossed the \$1B mark in TVL after the Dencun upgrade, making it the third most used optimistic rollup. Base even passed Optimism in the daily and monthly total number of active addresses in March 2024, while it managed to quadruple its daily number of transactions, crossing Arbitrum at 2M.

The unique factors contributing to Base's massive success stem directly from its retail-oriented design, quick fiat on-ramps, product integrations, and strong Coinbase user base. Initially, its successful user engagement launch campaign, Onchain Summer, drew in significant user numbers. However, the primary catalyst was the massive success of the first truly onchain social dapp, friend.tech, which broke records in terms of usage.

Several other teams also decided to use the OP stack and launch their general-purpose and application-specific networks. In September last year, Binance launched opBNB using the stack, which is built as the scaling Layer 2 solution for the BNB Smart Chain.

Furthermore, the artistic-oriented L2 appchain Zora launched in June last year, followed by the launch of the general-purpose network Mantle. A few more projects built using the OP stack include Manta Pacific, another general-purpose chain, Aevo, focused on derivatives, Mode Network, focused on on-chain gaming and trading platforms, Fraxtal, a network by one of the leading DeFi teams Frax, and Lyra, an L2 chain for the Lyra protocol.

In February 2024, one of the most awaited launches took place: the Blast team launched its OP stack rollup focused on producing yield from bridged tokens. It previously saw over \$2.3B in user deposits across several months of a strong marketing campaign.

The success of the Dencun upgrade

Following The Merge (2022) network upgrade, the Dencun upgrade was the most anticipated by the community. After being tested on three testnets prior to the mainnet launch, the successful upgrade was another incredible milestone for the Ethereum developers and community.

The Dencun upgrade is the first to address scalability and high transaction costs by introducing proto-danksharding and blob-carrying transactions, drastically reducing fees, and primarily benefiting Layer 2 networks. It took place on March 13, 2024, and is expected to have a profound impact on the ecosystem.

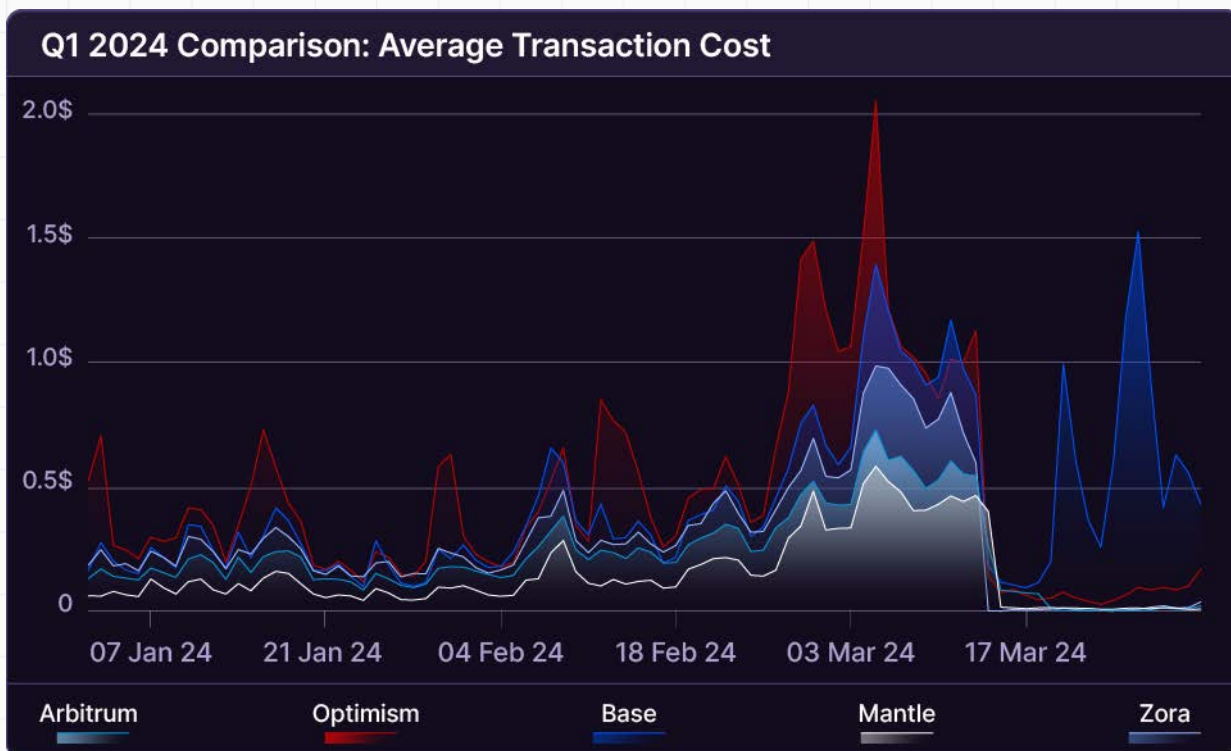
In terms of improvements, the upgrade was tied with the Byzantium upgrade, having nine total EIPs shipped together. The Dencun upgrade introduced several EIPs, with proto-danksharding and blob transactions (EIP-4844) being the most crucial. Hours and days after the upgrade, it was clear that blobs are drastically more cost-effective than calldata.

Thanks to protodanksharding and blob transactions, L2 networks are now able to store data on L1 more efficiently. Blobs are deleted approximately every two weeks, making blobs cheaper than typical transaction calldata, which was stored indefinitely.

Lower gas fees and faster transaction speed

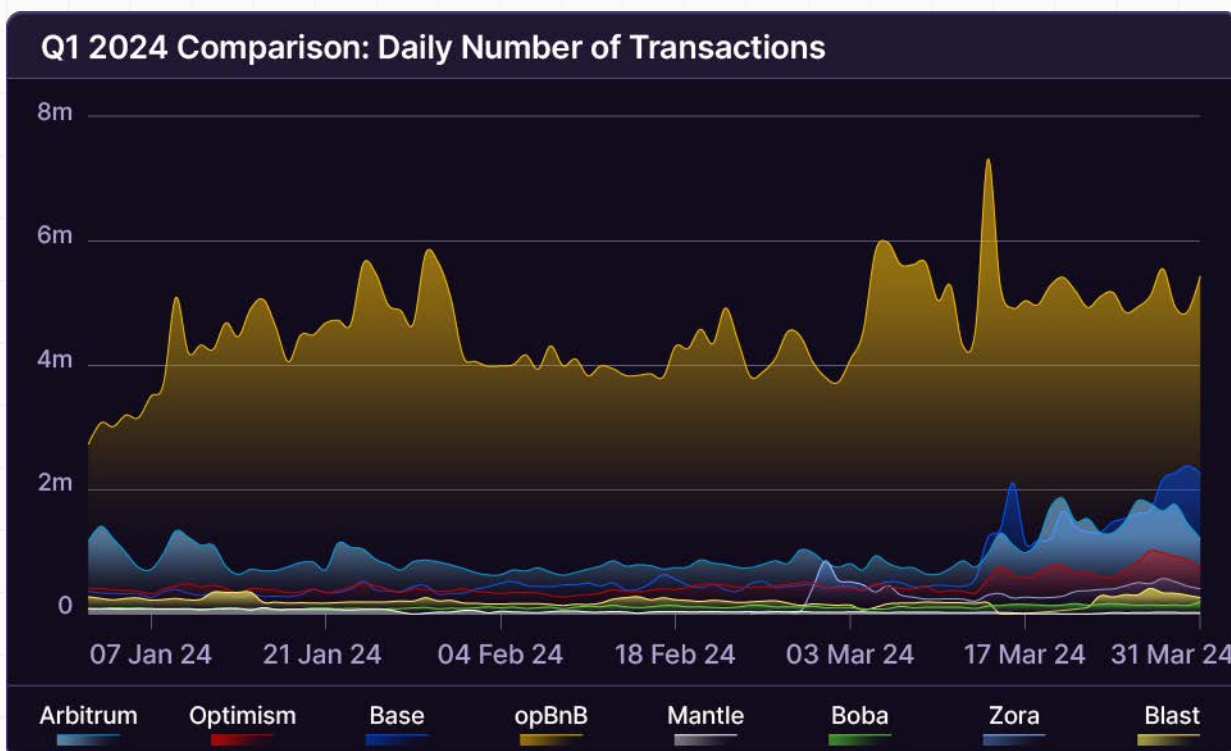
As a result, the upgrade immediately reduced gas fees and improved transaction speed upon finalization, with fees initially dropping to zero and subsequently stabilizing average transaction costs between \$0.001 and \$0.04. Both the average and median transaction costs drastically fell below the expected decrease of over 90% in the case of nearly all Layer 2 networks, with optimistic rollups seeing the highest reduction.

The **Dencun effect** cannot be overstated once we analyse the drop in fees or transaction cost of the most used optimistic rollups after March 13th. In the last two weeks of Q1, after the upgrade was successfully activated, the **average transaction cost has dropped to \$0.04** on Arbitrum, **\$0.08** on Optimism, **\$0.52** on Base, **\$0.03** on Mantle, and **\$0.01** on Zora. Fees on Base have since stabilized, catching up with other rollups, though they remain slightly elevated due to much greater usage and activity numbers.



Transaction activity increase

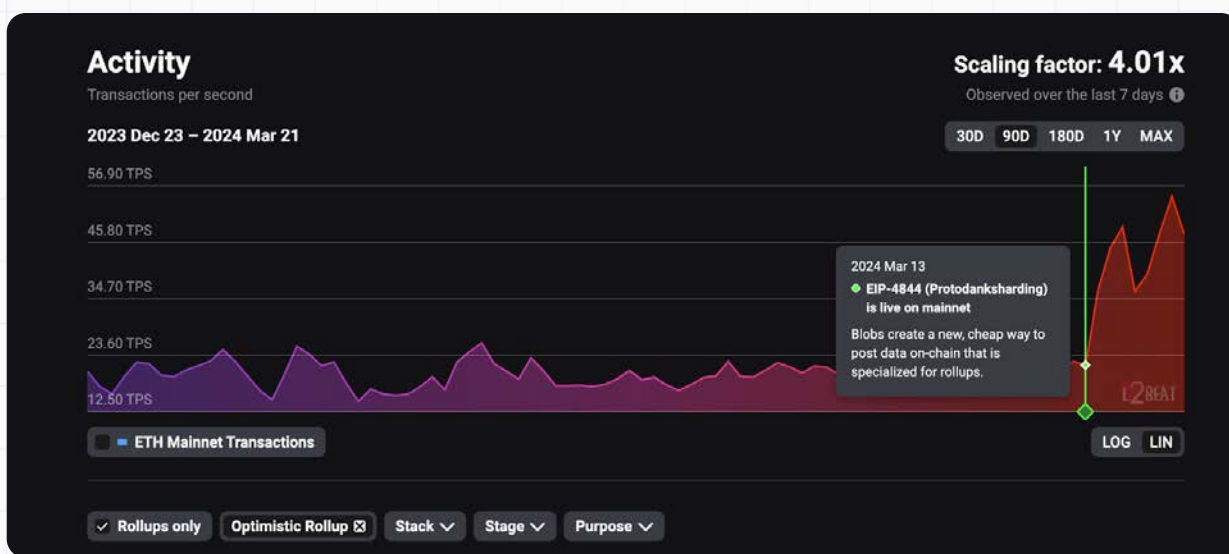
The second immediate effect of the Dencun upgrade was the increase in transaction activity, which benefited Base the most but, in turn, initially led to the least decline in fees. As the reduction in fees stimulated user activity, transaction activity spiked on all Layer 2 networks, with the highest spike occurring on Base, Arbitrum, and Optimism, respectively.



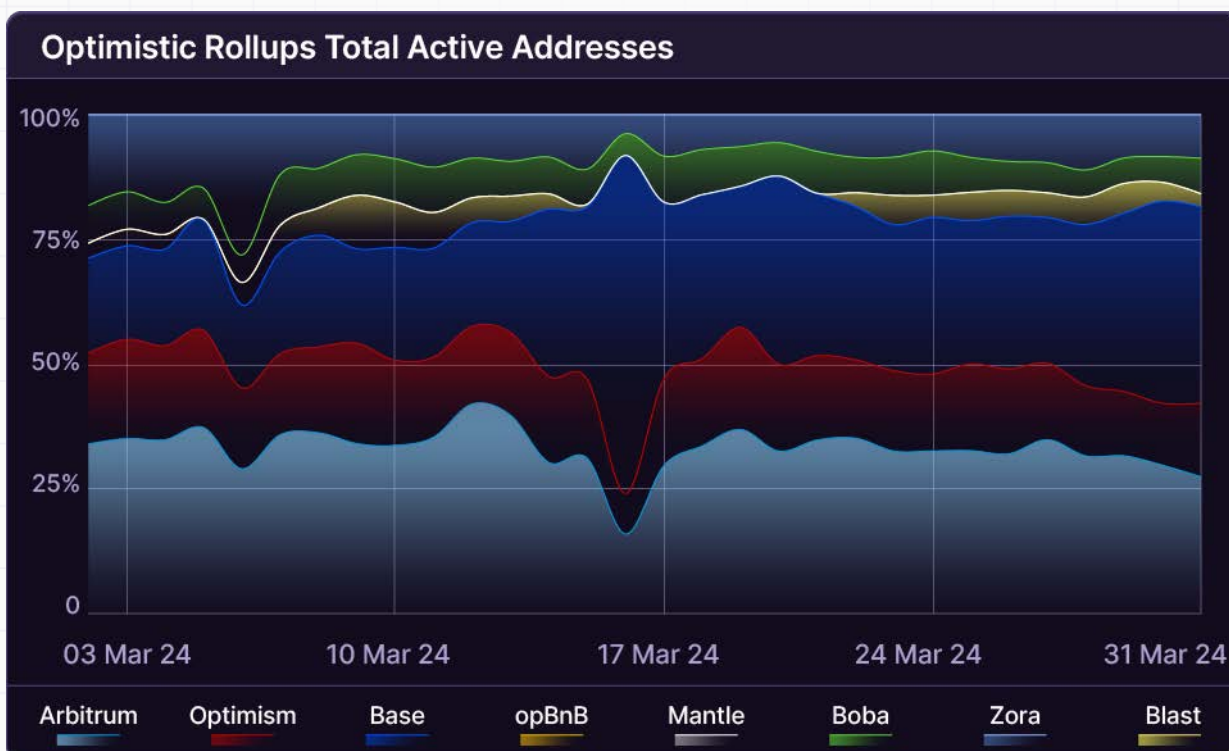
This reduction in fees opens opportunities for new, more complex applications on L2 solutions. It will also improve developer and end-user experience, especially in the growing multichain ecosystem where L2s and appchains will continue to gain momentum.

The reduction in fees due to the introduction of blobs is expected to further stimulate and increase transaction activity. This occurred immediately after the upgrade was finalized.

L2BEAT Scaling Factor of optimistic rollups before and after the Dencun upgrade:



Source: L2BEAT, Optimistic Rollup Activity



→ Chapter 03

Leading optimistic rollups

Among all the optimistic rollups, Arbitrum and Optimism retained their leading positions with Arbitrum One and OP Mainnet. Both Arbitrum and Optimism gradually became much more than just rollup solutions. They're now ecosystem powerhouses tackling Ethereum scalability from multiple angles, offering infrastructure, developer tools, and new ways to launch and deploy L2 and L3 rollups.

Following the success of Arbitrum and Optimism, several new optimistic rollups were launched last year, with the trend rapidly accelerating in Q1 2024. For instance, in a fairly short time frame, Base made significant strides forward and gained noteworthy traction, attracting developers and users alike.

Most other optimistic rollups were launched to tackle a specific use case or serve as an extension of a primary business case or need. While the report features optimistic rollups with notable traction or history, it's also worth noting that new optimistic rollups were launched during the preparation of this report.



OVER 750K FORKS
WERE CREATED ON
ARBITRUM ONE.

Arbitrum One

“Optimistic rollups are the most efficient way to scale Ethereum today. Arbitrum is the most mature rollup, with a full suite of developer tooling such as wallet kits, analytics platforms, indexing, and attestation. Furthermore, it provides the best experience for developers through the technology’s proven security, robust infrastructure, and established ecosystem. We look forward to increasing the prevalence of optimistic rollups with Orbit, our community-licensed stack for deploying your own L2 or L3.” - Offchain Labs Team

As one of the leading optimistic rollups, Arbitrum has seen significant on-chain activity over the past year, with several key indicators:

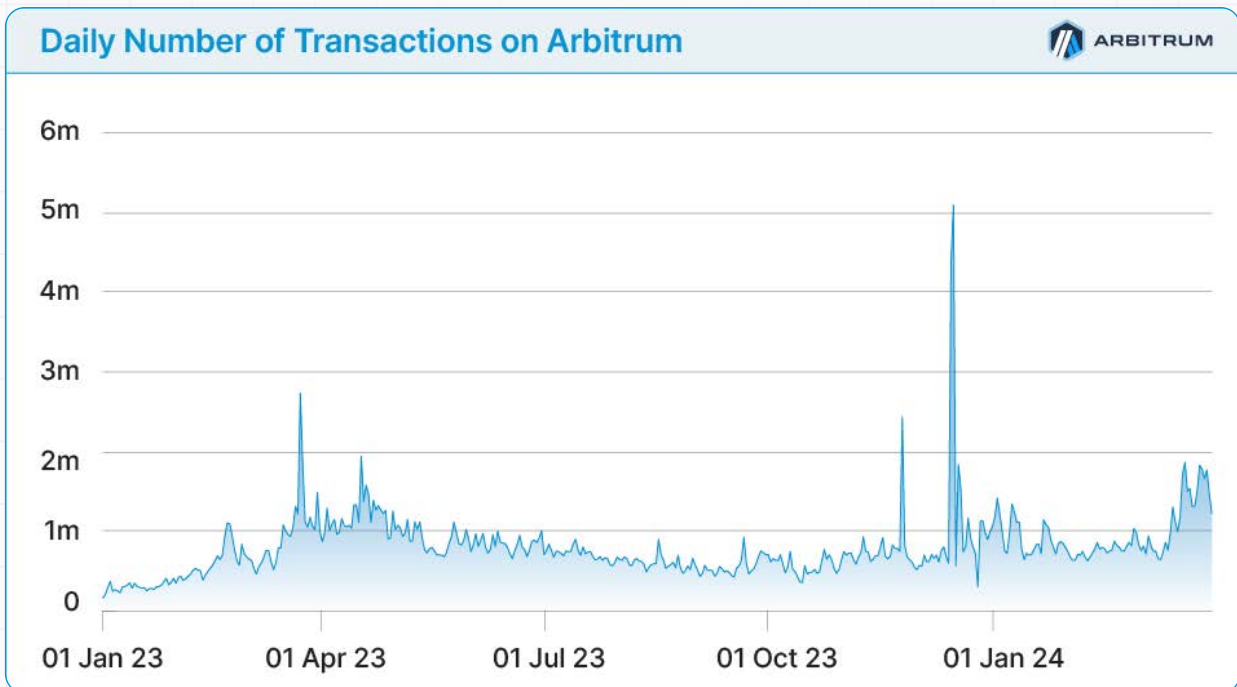
- The Arbitrum bridge had a substantial increase in TVL, amounting to over \$4B.
- 280M ETH was added to the bridge contract YTD, which is a 21% increase when compared to the previous year.
- DeFi was one of the main drivers of growth in on-chain activity, with TVL increasing by 37.5% YTD (~\$920M).
- The all time high of cumulative DEX volume reached \$4.2B on March 4.
- January was the third highest gas usage month in Arbitrum history.
- Stablecoin TVL also had an increase of 50%, growing by \$1.1B.
- Arbitrum was the first L2 to hit \$1B in natively minted USDC.

Additionally, EIP-4844 had a major impact on transaction fees on Arbitrum, leading to around a 10x decrease. With the recent Dencun upgrade, Arbitrum is likely to further see an increase in on-chain activity for reasons such as increased arbitrage opportunities, lower risk of speculation, and reduced cost of development.

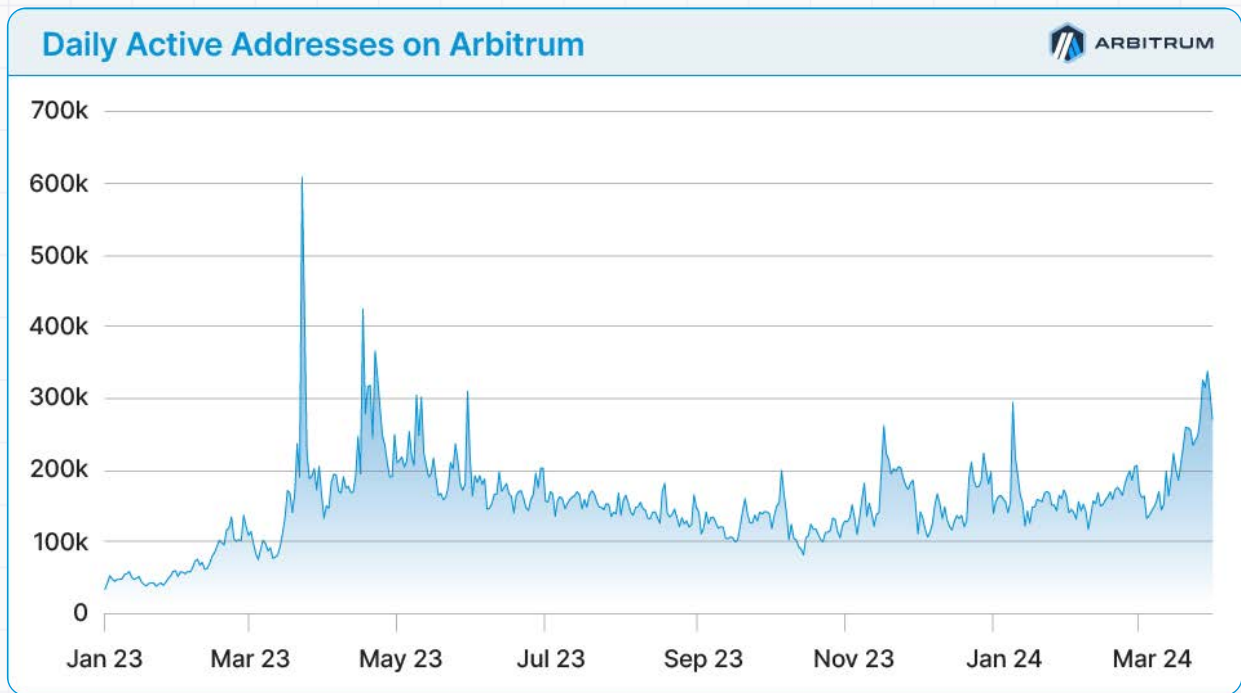
The leading optimistic rollup



Arbitrum One Total TVL: According to the L2BEAT methodology of tracking the Total TVL of rollups, summing all canonically bridged, externally bridged, and natively minted tokens, and converting them to USD, Arbitrum One’s leading position among other optimistic rollups seems firmly established, accounting for over 40% of the total optimistic market share.



Daily Number of Transactions on Arbitrum One: Until the very end of Q1 2024, and the overarching Dencun upgrade benefits, Arbitrum was leading in the number of transactions among all other rollup solutions, crossing the number of transactions executed on the Ethereum Mainnet on more than one occasion. Peaks in activity on Arbitrum happened when \$ARB token was launched and when Arbitrum kickstarted its STIP program.



Daily Active Addresses on Arbitrum One: Throughout the previous year, Arbitrum was the optimistic rollup with the most active addresses. Though the metric isn't perfectly accurate in terms of number of users, since users can own more than one address, it's still an important metric giving insights into the user base and activity of a chain. As with the number of transactions, peaks in the number of active addresses were when Arbitrum launched its \$ARB token and \$ARB incentive programs.

Projects driving on-chain activity on Arbitrum

A few notable projects are driving on-chain activity on Arbitrum, contributing to network adoption:

- **GMX:** Perps DEX with the highest TVL of any project on Arbitrum, [GMX has \\$4.6B in derivatives volume YTD](#). It's one of the projects leveraged most by other dapps, with over 80 teams integrated with GMX/GM/GLP pools.
- **Hyperliquid:** [25%+ of USDC on Arbitrum is locked in Hyperliquid](#), a perps DEX built on Arbitrum. Hyperliquid consistently has the most users of any perps DEX on the market. Traders deploy their own strategies that any user can provide liquidity to, with over 1,000 strategies created to date.
- **Vertex:** Perps DEX that launched in 2023 and gained significant traction toward the end of the year, Vertex is consistently a [top 5 venue in 24hr derivatives volume](#). It's also one of the first teams to work Elixir, a decentralized market-making protocol.
- **Arbius:** Arbius is a decentralized AI project powering peer-to-peer machine

learning built on Arbitrum Nova. It's largely responsible for the recent spike in activity on Arbitrum Nova.

- **Camelot:** Camelot is an Arbitrum-native spot DEX with \$136M in TVL. Arbitrum-native projects typically choose to bootstrap their liquidity on Camelot. In 2024, Camelot committed even further to the Arbitrum ecosystem by partnering with RaaS teams to be the native DEX on every Arbitrum Orbit chain.
- **Treasure:** One of the biggest Web3 gaming ecosystems, Treasure is launching their own Layer 2 ecosystem using Arbitrum Orbit called Treasure: Infinity chains. Each of their games will have its own Layer 3 settling to the Treasure Layer 2. Arbitrum Orbit allows them to use their native token, \$MAGIC, as the gas token for the ecosystem.



OVER 17M
WEB3 ACTIONS WERE
EXECUTED ON OP
MAINNET.

Optimism's OP Mainnet

OP Mainnet is an EVM-equivalent L2 optimistic rollup scaling solution built on top of Ethereum Mainnet and launched by the Optimism team. Formerly known as Optimism, once the company's vision became much grander and encompassing, the rollup solution was renamed to OP Mainnet. It became one of two leading rollup solutions for the Ethereum network, and of the key DeFi ecosystems due to its low transaction fees, developer incentive programs, and focus on decentralized and open-source approach.

It's important to highlight that Optimism Collective greatly expanded its focus and work on the whole Superchain ecosystem instead of just OP Mainnet. Hence, they're now devoted to building a world that benefits all, and is owned by none.

The primary blockchain network of the Optimism ecosystem reached \$8.3B in total TVL per L2BEAT methodology, and \$1B in DeFi TVL in Q1 2024, according to DeFiLlama at the end of the quarter. Since its launch, the rollup provided greatly lower transaction costs and faster execution, while relying on Ethereum for security, emerging as one of the essential projects in the Web3 space.

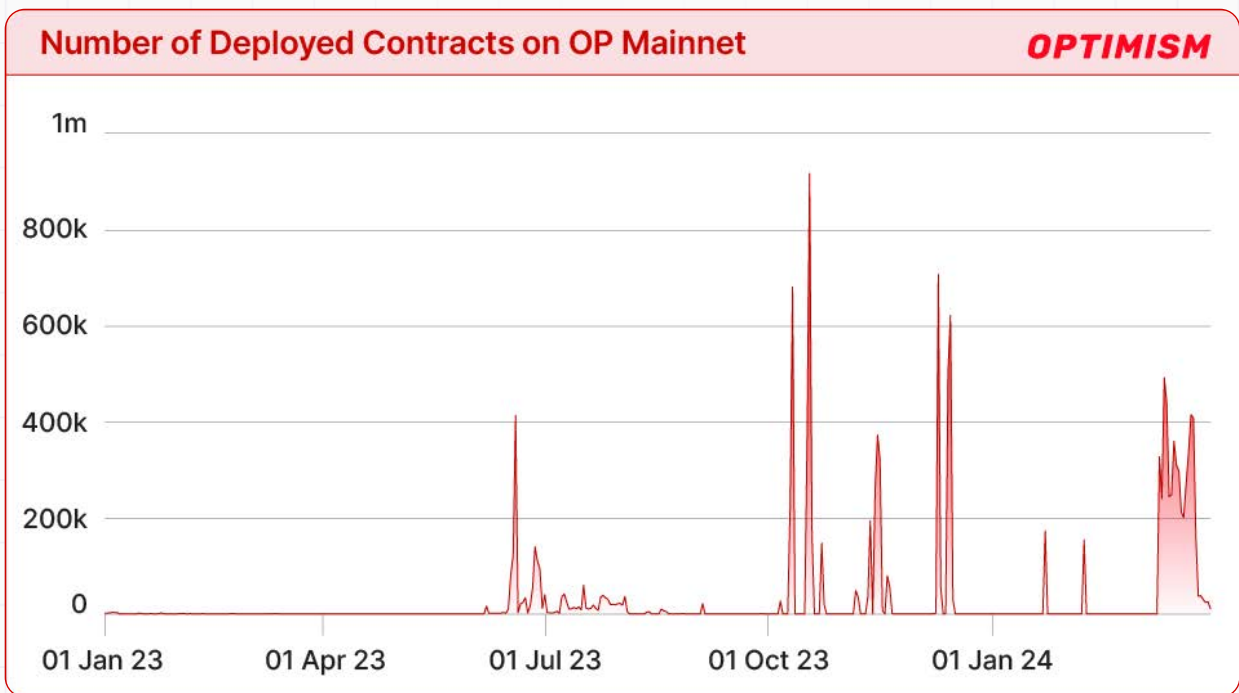
The key OP Mainnet on-chain metrics and developments include:

- In Q1 of 2024, the network averaged around 400K transactions per day, while after the Dencun upgrade, the number spiked to over 700K.
- Per L2BEAT, OP Mainnet achieved \$4.3B canonically bridged assets.
- Following its Ecotone upgrade, adopting EIP-4844, average transaction cost on OP Mainnet dropped by more than 90%, below \$0.1 making it one of the cheapest rollups for users to transact on.
- OP Mainnet and other Superchain networks achieved 2-second block time compared to Ethereum Mainnet's 12.5-second block time.
- Span batches upgrade in February 2024 led to a reduction of overhead costs of running a standard rollup OP Chain by 90%, from over \$1M to \$40K per year.
- Median gas cost to swap on Optimism with blobs decreased drastically.

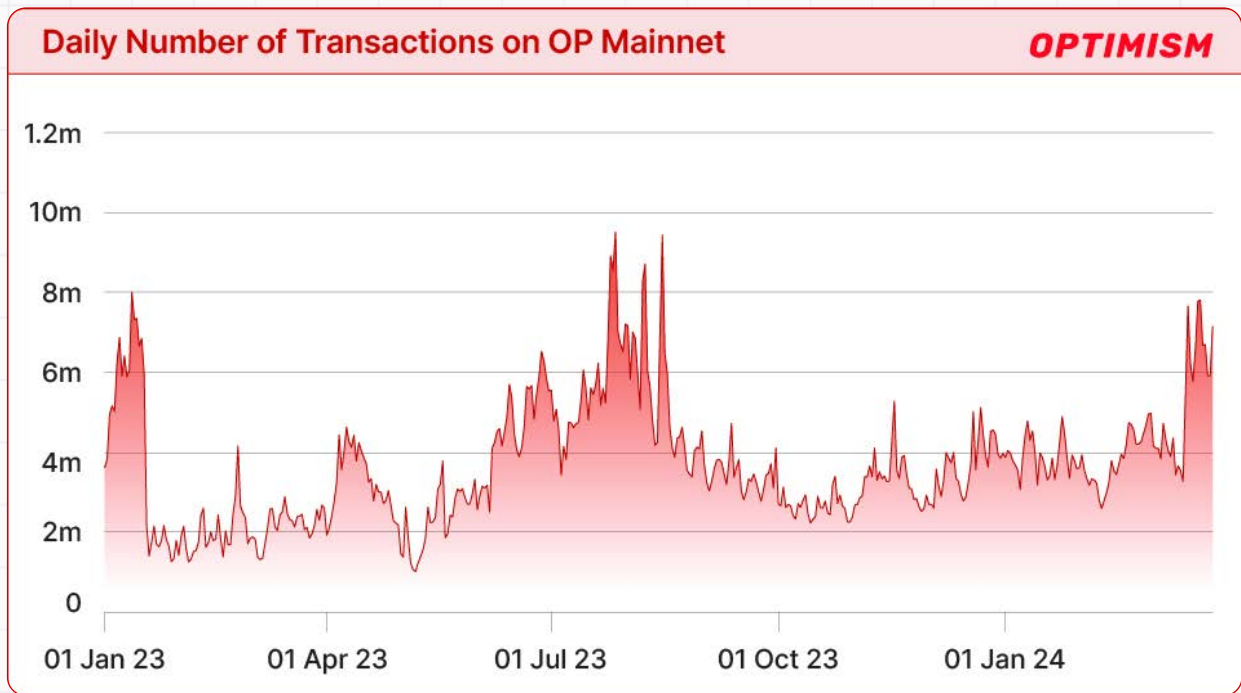
Optimism ecosystem cornerstone - OP Mainnet



OP Mainnet's DeFi TVL: The total value locked of decentralized finance applications of OP Mainnet offers a glimpse into a gradually growing DeFi ecosystem with fairly consistent usage metrics across the board, though a big chunk of Optimism's overall TVL is now redistributed across the Superchain ecosystem.



OP Mainnet Deployed Contracts: Optimism's primary network saw a significant growth in the number of developers, builders, launched projects, and the overall number of deployed contracts. Optimism's overall ecosystem now has two core contributing teams from both Optimism Collective and Base improving on the codebase.



Daily Number of Transactions on OP Mainnet: The peak in activity on OP Mainnet seems to coincide with the launch of Base and Optimism’s participation in the Onchain Summer campaign which drew significant number of users across the Optimism ecosystem. The chart showcases the swift rise in the transaction number following the Dencun upgrade.

Projects driving on-chain activity on Optimism’s OP Mainnet

Projects like Uniswap, Worldcoin, Velodrome/Aerodrome, Synthetix, Zora, Farcaster, and Fren Pet are among the most utilized on OP Mainnet and the Superchain. These projects facilitate a diverse array of applications spanning DeFi, social, identity, NFTs, gaming, and more.

Leveraging these platforms enables modularity in dapp development by providing access to liquidity pools (e.g., Uniswap), real human identities (e.g., Worldcoin), social graphs (e.g., Farcaster), etc., thereby fostering greater innovation and adoption within the network. It’s worth highlighting that at the very end of Q1, Velodrome announced a partnership with Optimism, turning the leading DEX into a liquidity hub for the entire Superchain ecosystem.

“The OP Stack has fast become a tech stack of choice for web3 builders, with over 40% of Ethereum Layer 2 networks leveraging the codebase. A multichain future requires taking a shared standard codebase a step further; for the web3 future to succeed, individual chains need to securely scale and communicate. Optimism’s Superchain is a growing network of Layer 2s all built on the OP Stack. A growing number of companies, including Base, Zora, Mode, and Lattice, have committed to the Superchain vision, working towards scalability and shared innovation for the entire web3 ecosystem. Chains deploying on the Superchain also commit a share of their revenue back to the Optimism Collective to support open source development and other improvements to the Superchain ecosystem, benefiting builders and users alike.” - Optimism Foundation



opBNB

opBNB is a Layer 2 optimistic rollup network built on top of the BNB Smart Chain (BSC) using the OP stack codebase. The Binance team decided to launch opBNB to offer its users the benefits of using the Layer 2 infrastructure through cheaper and faster transactions. Hence, opBNB functions as a scaling solution for the BSC ecosystem.

However, because it is built using the OP stack, opBNB is entirely interoperable with other L2 rollups also built using the stack, such as Optimism, Base, and many others. Yet, the key difference between opBNB and other optimistic rollups lies in their parent networks remains.

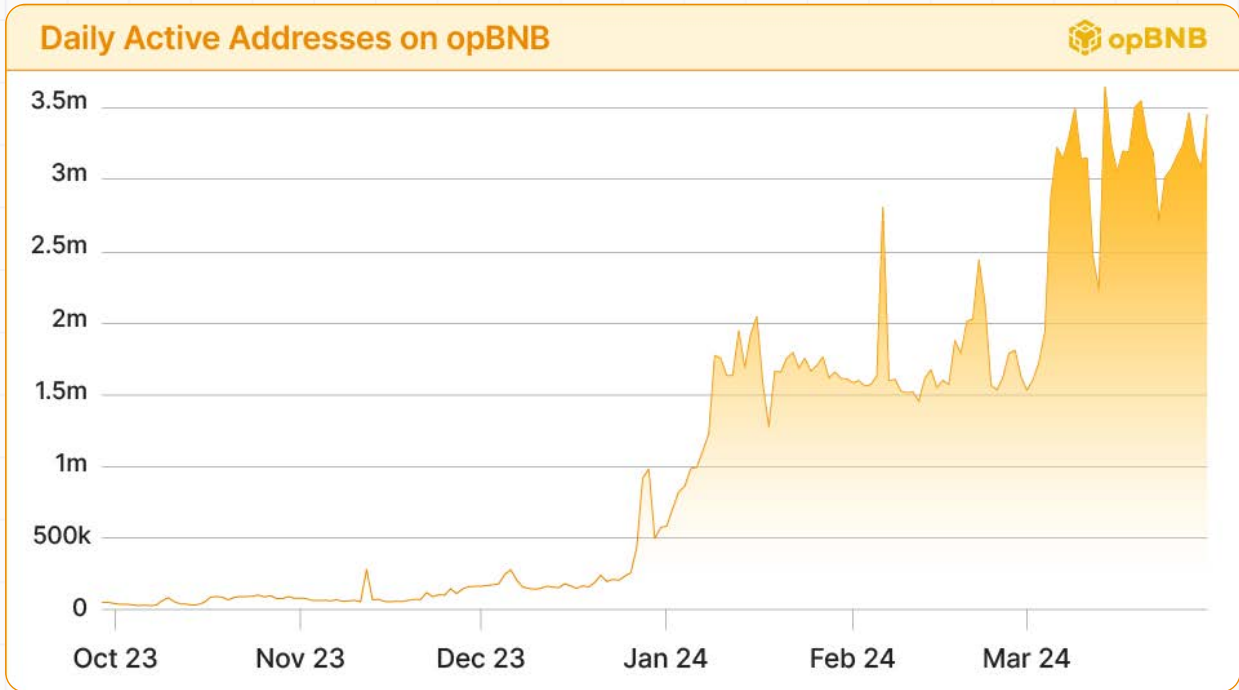
The network launched in September of 2023, after a few months of testing, during which the network achieved some [incredible results](#), processing over 35M transactions from 435K wallets, with 150+ dapps deployed. Since live, opBNB boasts equally impressive and high-performance on-chain metrics.

In our previous report, we covered BSC in more detail, emphasizing its large number of wallets, capability to process large numbers of transactions, and growing DEX volume. To further address the scalability and cost challenges of BSC, Binance claimed that the bundling of transactions before submitting them enabled benefits such as:

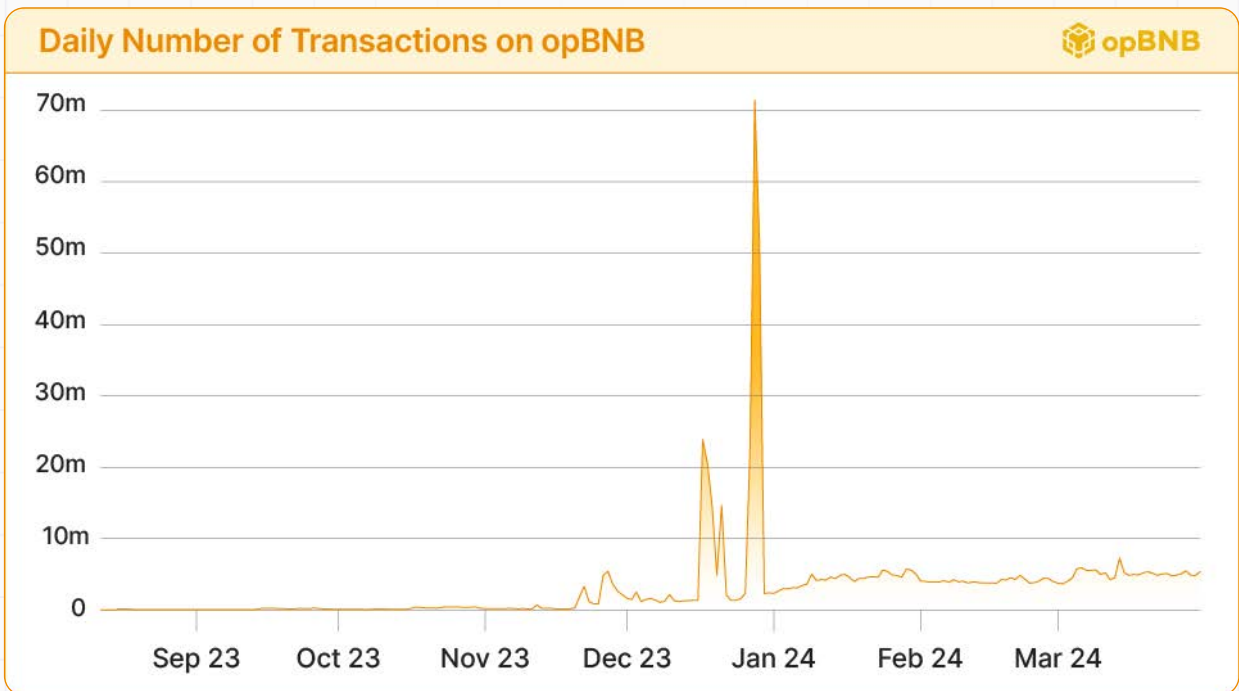
- **Faster transactions:** opBNB can achieve **4000 times** the **TPS** of BSC according to official information from Binance, making the case for rollups as a scaling solution, albeit not scaling Ethereum.
- **Lower fees:** opBNB aims to achieve transaction cost or average gas fee of **\$0.001**, compared to BSC fees of around \$0.24.
- **User experience:** better user experience and a wide variety of dapps.

Likewise, as is the case with other Layer 2 networks, opBNB addresses the key challenges of improving scalability and increasing interoperability while inheriting the security of its parent chain, in this case, BSC.

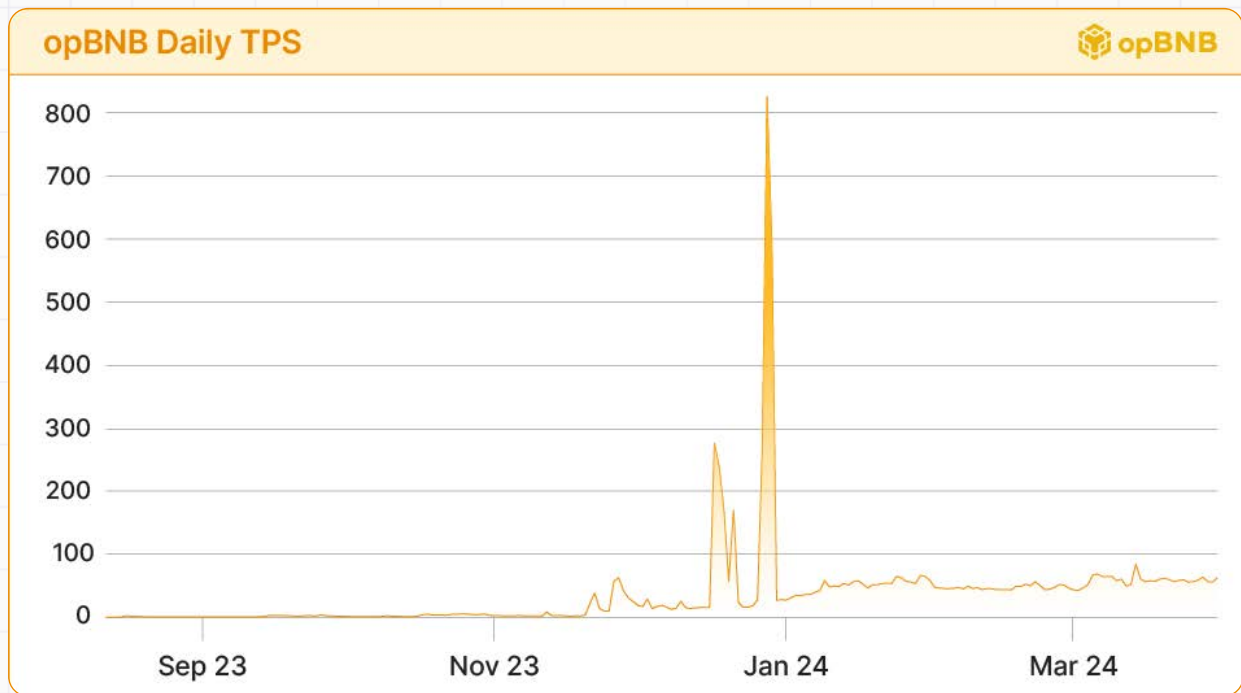
High-performing optimistic rollup



Daily Active Addresses on opBNB: As a Layer 2 solution and rollup of the BSC (BNB Smart Chain), opBNB helps scale the Binance network. The meteoric rise in the number of active addresses can be attributed to opBNB extending the activity of BSC and sharing a great number of dapps with the parent chain. *Official opBNB explorer data.**



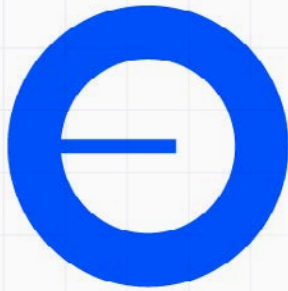
Daily Number of Transactions on opBNB: In general, there is a high volume of activity on the opBNB network. Spikes in activity can probably be attributed to testing the networks' capabilities. *Official opBNB explorer data.**



opBNB Daily TPS: opBNB recored a significant spike in its throughput on more than one occasion at the end of 2023. As with the number of transactions, this can probably be attributed to testing the networks' capabilities. *Official opBNB explorer data.**

Projects driving on-chain activity on opBNB

Currently, most notable projects driving up substantial activity on opBNB include gaming and social projects which are deployed on both BSC and opBNB, where it primarily functions to improve the throughput of the parent chain. Binance is positioning opBNB to support high-throughput use cases present in gaming. Projects launched on opBNB first include Well3, MyShell, Holoworld AI, and Alaya AI according to their [ranking page](#).



OVER 11M
ALERTS WERE
SENT ON BASE.

Base

Base is the first Layer 2 optimistic rollup built on top of Ethereum using the OP stack. Coinbase's idea behind it was based on the notion of providing a decentralized on-chain experience and making Ethereum accessible to everyone. The famous centralized exchange leveraged its expertise and unique market position to provide a fully Coinbase-integrated experience with its products seamlessly incorporated. The rollup is hence EVM-equivalent with focus on security, scalability, and stability, while providing lower transaction fees, especially compared to other centralized exchange products fees.

The success story of Base has many contributing factors. With their new rollup, Coinbase showcased its dedication to the open-source and decentralization narrative present of the Web3 community, from the get-go. They joined Optimism's initiative as the second core dev team building and upgrading the OP stack, making it truly the public good accessible to everyone.

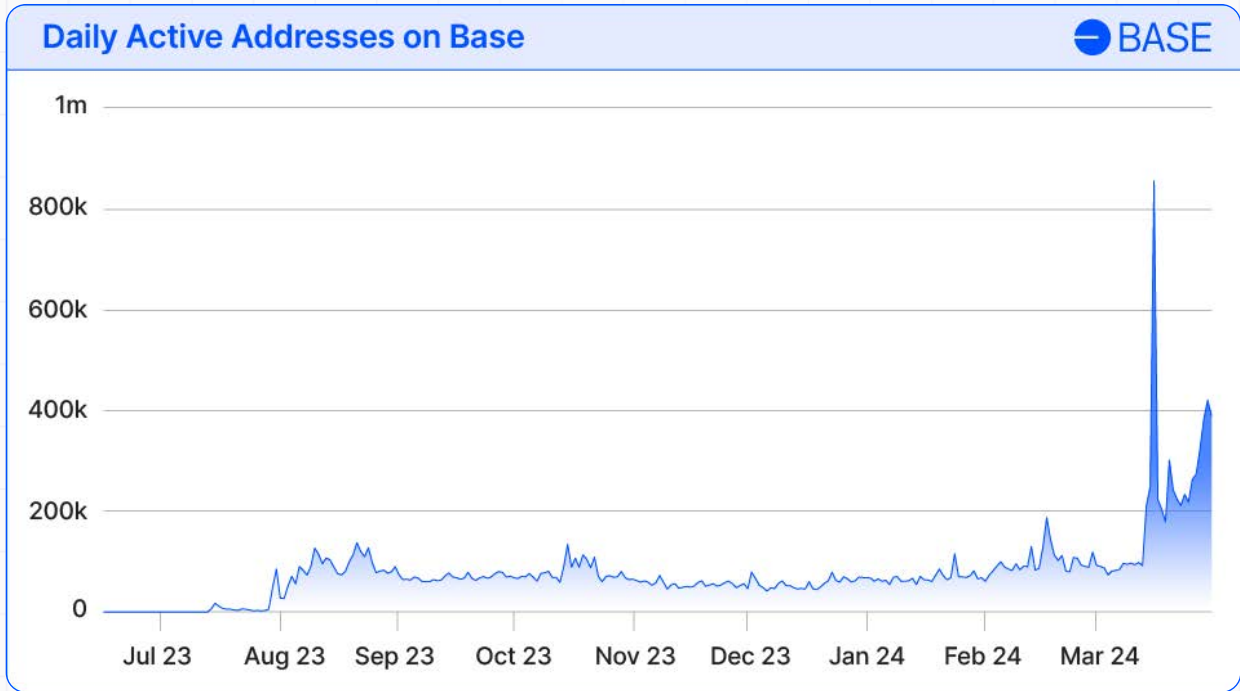
Coinbase committed to contributing to the development of the entire ecosystem, by officially partnering with Optimism and sharing the revenue. Base will share either 15% of gross profits generated or 2.5% of the total revenue from its sequencer. In return Optimism will provide Base with over 118M OP tokens over the span of several years, making it one of the key participants in the Optimism's on-chain governance.

The community support Base received due to its open-source, decentralized, EVM-equivalent approach has also been impactful. Numerous infrastructure and developer tools supported Base from its inception. Leading DeFi protocols also joined as launch partners, with over 100 dapps deployed. By leveraging the resources at its disposal, Coinbase created a viral launch campaign "**Onchain summer**" that attracted the Web3 community and users minting unique NFTs like those from collaboration with **Coca-Cola**.

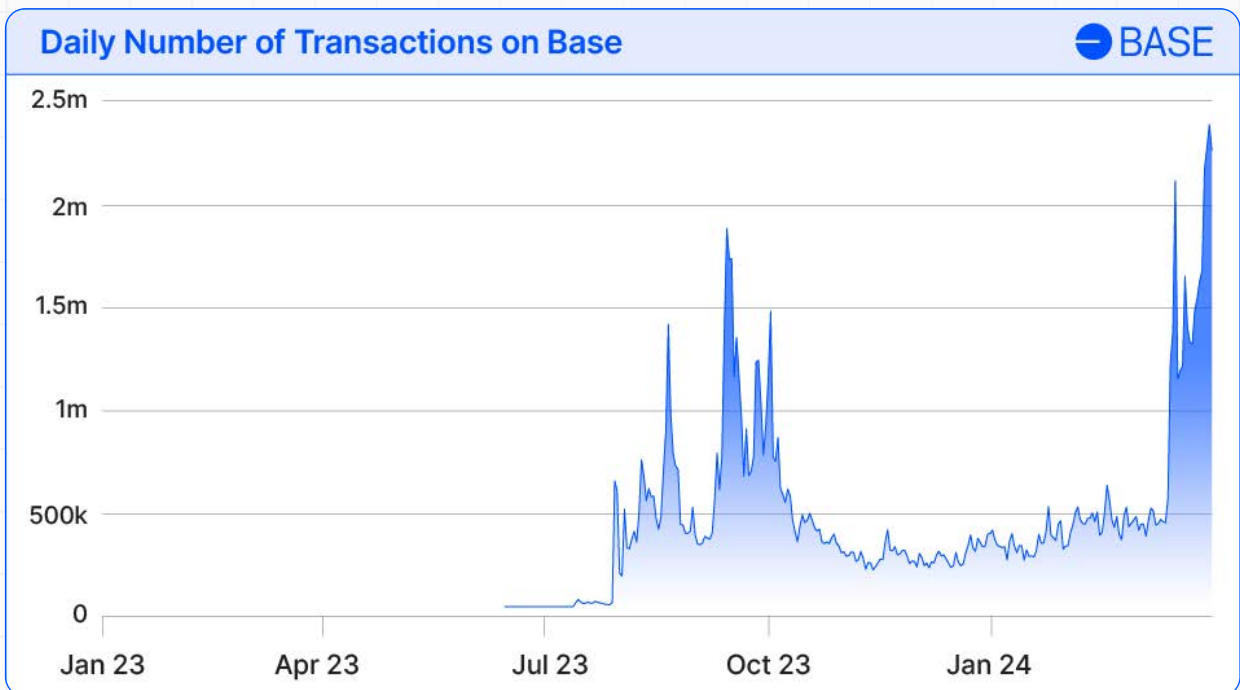
Since its mainnet launch in August of 2023, Base has made significant strides. Two major catalysts led to surge in usage activity on the chain. The first one was the launch of **friend.tech**, the first massively viral onchain social experiment which achieved over **12M transactions**, with 9M taking place in just two months. The second is the ongoing **memecoin frenzy** which led to the recent explosion of activity on Base. In turn, DEX projects, users and volume, alongside the number of token pairs have all surged.

The fastest-growing optimistic rollup

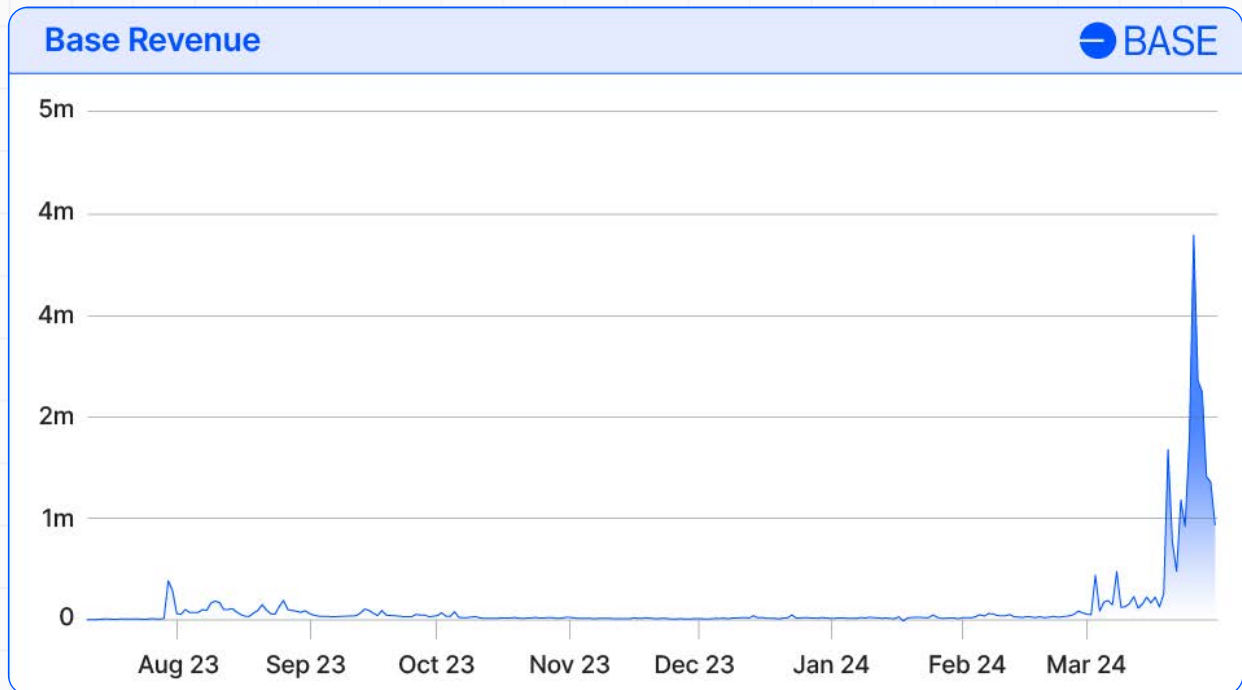
Daily Active Addresses: Riding the wave of increased user adoption, Base crossed \$1B in TVL at the end of Q1 2024. The impact of the Dencun upgrade was most evident in the case of Base. The number of users or daily active addresses on the rollup surged from 60K on average to over 200K every day since the upgrade, spiking even above 800K. Though the network is growing, some percentage can be probably attributed to farming bots and multiple accounts from a single user.



Daily Number of Transactions on Base: The increase in the number of daily active addresses, the ever-growing number of token pairs, and a sprawling NFT ecosystem consistently increased the number of transactions, breaching 1M daily transactions and 2M at the end of Q1.



Base Daily Revenue: Base is currently the most successful revenue-generating rollup network with over \$40M in revenue, a profit margin ratio of 0.64 and total profits of around \$28M. Following the Dencun upgrade, Base saw a significant increase in the number of revenue-generating contract deployments.



Projects driving on-chain activity on Base

A spike in user activity has led to DEX projects such as Aerodrome (\$529 TVL) and Uniswap (\$208M TVL) topping the list of most used dapps, accompanied by leveraged farming protocol Extra Finance (\$78M TVL). The remaining protocols in the top ten list in Q1 are lending and borrowing protocols Overnight Finance, Compound, Moonwell, and Aave V3, as well as Beefy, friend.tech, and Sushi.



OVER **1.3B** NODE RPC EXECUTIONS WERE RECORDED ON BOBA NETWORK.

Boba

Boba Network is a multichain Layer 2 optimistic rollup, scaling both the Ethereum and BNB ecosystems. Boba has gained traction over the past year, with \$6.8M in TVL, according to DefiLlama. So far, Boba submitted around 39.5M transactions to Ethereum Mainnet, with immediate execution time.

With the launch of Anchorage, L2 rollup client and its own implementation of Optimistic Bedrock, Boba will be the only L2 that uses multiple clients, supporting client diversification. Additionally, Boba Network's Anchorage is expected to reduce fees by more than 40% and open the path for EIP-4844 support.

The Boba Network team's long-term vision is to harbor an innovative ecosystem, with projects building dapps never seen before. To achieve this, they encourage builders to use the Boba tech stack, including Hybrid Compute, an innovative toolset that connects Web2 data with Web3 protocols.

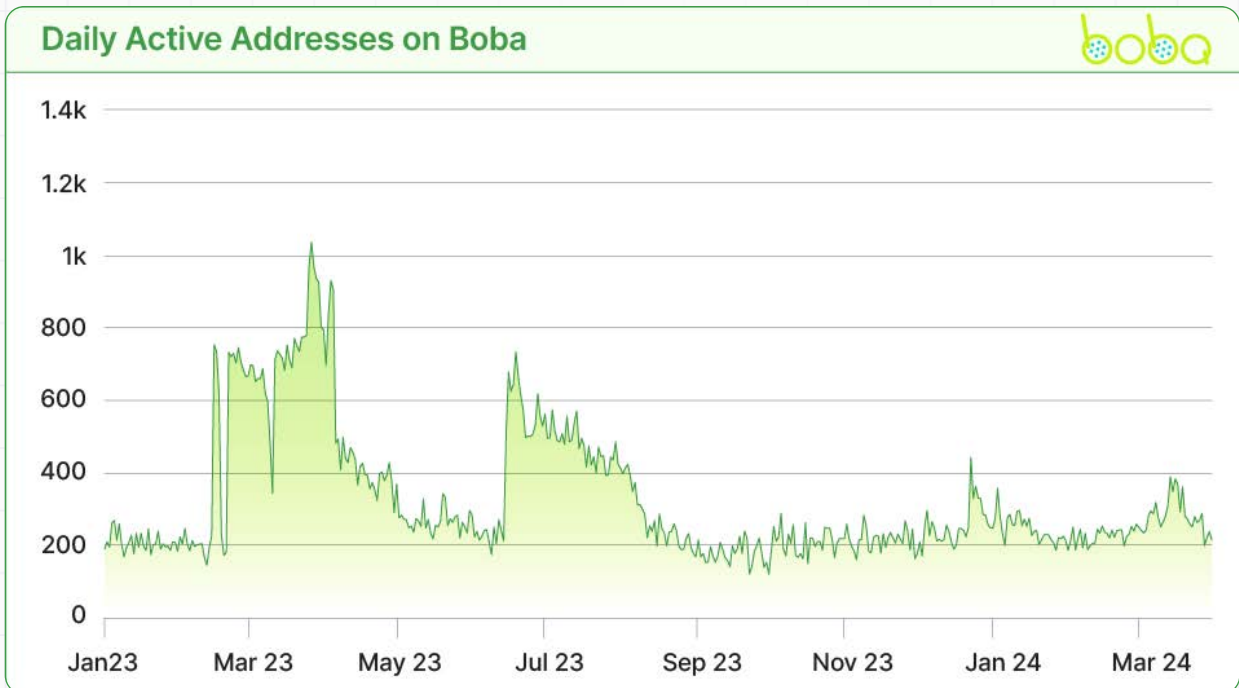
Aside from Hybrid Compute usage, some of the other emerging development trends on Boba Network include account abstraction, the use of multiple clients, and cross-chain messaging developments.

Technology has really matured to catch up with the initial vision of optimistic rollups. While the earlier generations of optimistic rollups made compromises of expediency because of technology gaps, thanks to significant advancements across the ecosystem, the latest iterations didn't require similar compromises.

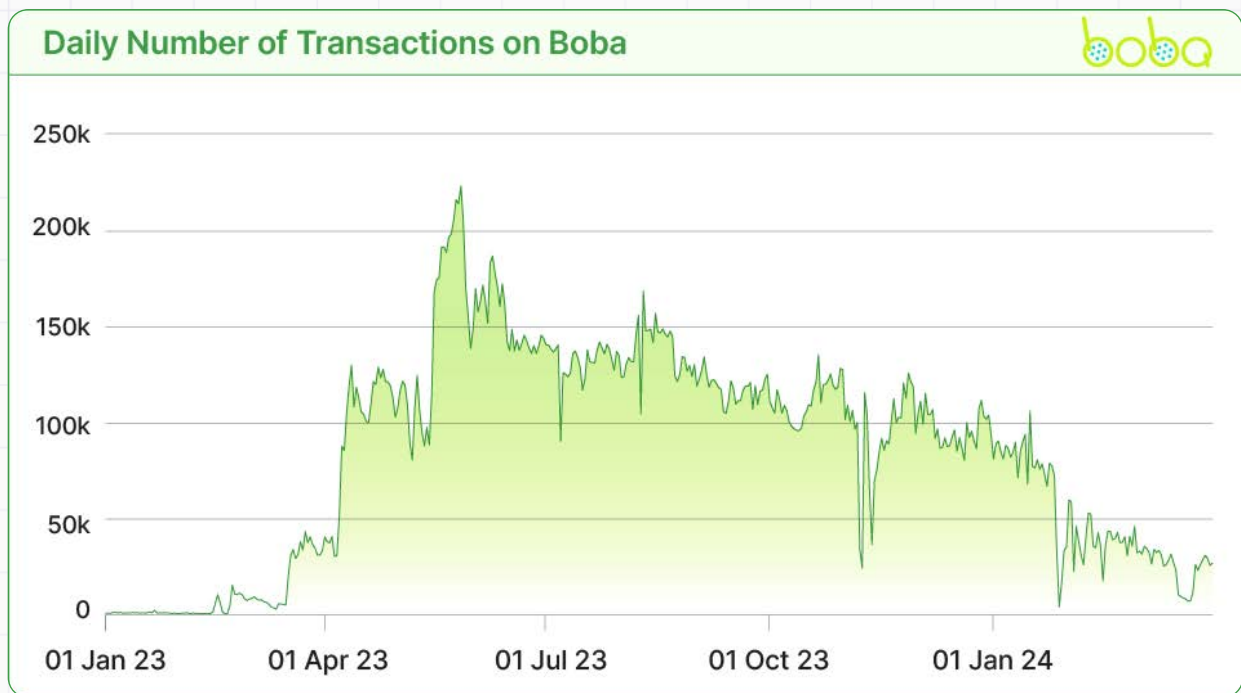
On-chain activity of one of the first optimistic forks



Boba DeFi TVL: Boba seems to be slightly struggling with retaining the activity from 2022 throughout the previous year. The rollups' DeFi TVL recovery coincides with the overall market recovery that started at the end of 2023.



Daily Active Addresses on Boba: There was not a lot of activity on Boba throughout the 2023.

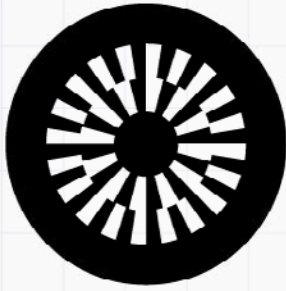


Daily Number of Transaction on Boba: Boba's on-chain metrics showcase a decreasing number of daily transactions on the network. Its scheduled Anorage upgrade will probably improve the overall on-chain metrics, once the network makes use of the Dencun upgrade and benefits.

Projects driving on-chain activity on Boba

Boba features around 33.2K of active users across various projects, with DeFi being one of the main sources of activity. Some of the most used protocols and projects driving growth on Boba include ROVI, a multi-purpose infrastructure app and one of the main drivers of activity on Boba, Oku, and Oolong, the liquidity hub for Boba Network.

Some of the upcoming projects expected to drive on-chain activity on Boba further include Router Protocol, Tokensoft, Icecreamswap, and Zoth.



**OVER 15K
TRANSACTIONS WERE
MONITORED ON
MANTLE IN Q1 2024.**

Mantle

As another L2 optimistic rollup, Mantle enhances Ethereum scalability significantly, offering cost-efficient transactions, increased transaction throughput, and reduced latency. After completing the Mainnet v2 Tectonic upgrade in Q1 2024, gas fees on Mantle further decreased thanks to the implementation of Optimistic Bedrock. Additionally, the upgrade improves the operability of Mantle Network with other EVM chains based on the OP stack.

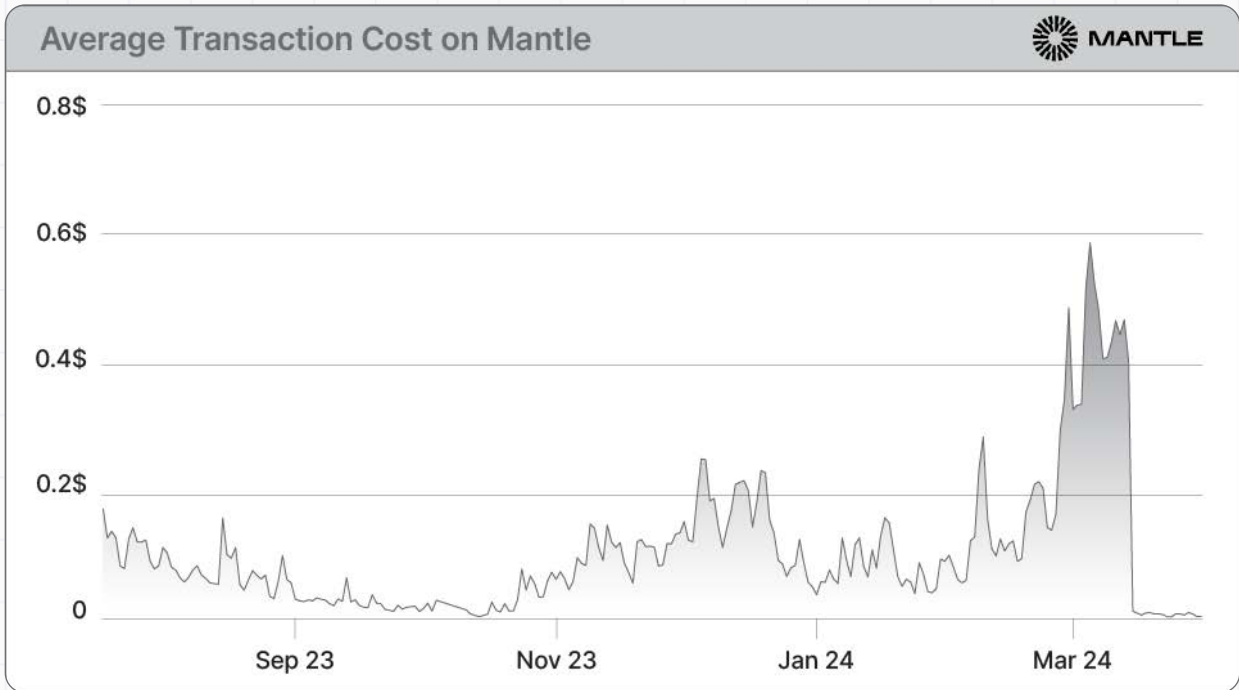
Mantle aspires to cultivate the most expansive ecosystem within Web3, aiming to transform its community into the most influential and extensive network within this domain. This vision entails propelling the Web3 ecosystem forward by fostering the growth of projects, thereby advancing the goal of widespread adoption.

Our strategy for the ecosystem centers on collaborating with established infrastructure teams and other ecosystem developers rather than pursuing a vertically integrated model. We believe that in Web3, value is derived from composability, emphasizing value creation through collaboration, as opposed to vertical integration, which prioritizes control and monopolistic tendencies.

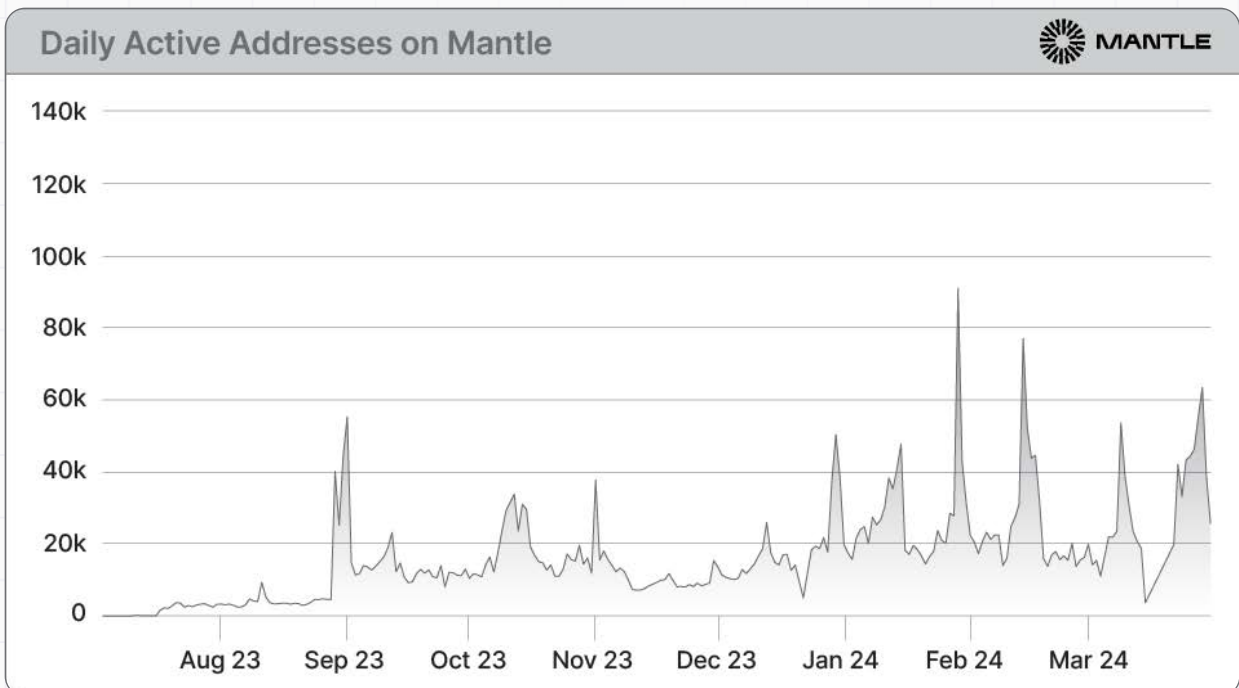
Some of the key trends on Mantle include the growth of DeFi, DePin, NFTs, gaming, and infrastructures, along with innovations in cross-chain connectivity, privacy enhancements, and user interface improvements.

As for rollup-specific developments, recent advancements have been focused on developing decentralized sequencers, which help mitigate the risk of single points of failure and bias in transaction ordering. They also play a crucial role in enhancing efficiency and security for Layer 2 solutions.

The sprawling ecosystem of Mantle



Average Transaction Cost: Since its launch, Mantle Network’s transaction costs have remained consistently low, despite its growing DeFi ecosystem. After spiking at the start of the year, fees on Mantle have drastically decreased to below \$0.02, dropping even below \$0.01, making the network more appealing.



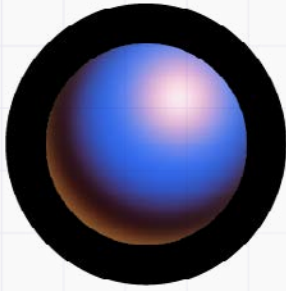
Daily Active Addresses on Mantle: Though not large in numbers, the number of active users on the rollup has held steadily since its launch with occasional spikes in activity.



Mantle DeFi TVL: With an increasing number of DeFi dapps being launched on Mantle, it's no wonder that the DeFi TVL on the network is consistently growing, according to DeFiLlama.

Projects driving on-chain activity on Mantle

Mantle currently has \$270.96M in TVL, with multiple notable projects driving its on-chain activity. INIT Capital and Merchant Moe are the two fastest growing in terms of TVL, with \$90.09M and \$26.96M, respectively. DEXs such as Agni (\$53.68M TVL), Butter (\$3.41M TVL), and FusionX (\$17.03M TVL) are the ones users use most often for token swaps, including mETH-ETH, or MNT-stable coins.



**OVER 30K
SIMULATIONS
WERE EXECUTED
ON ZORA.**

Zora

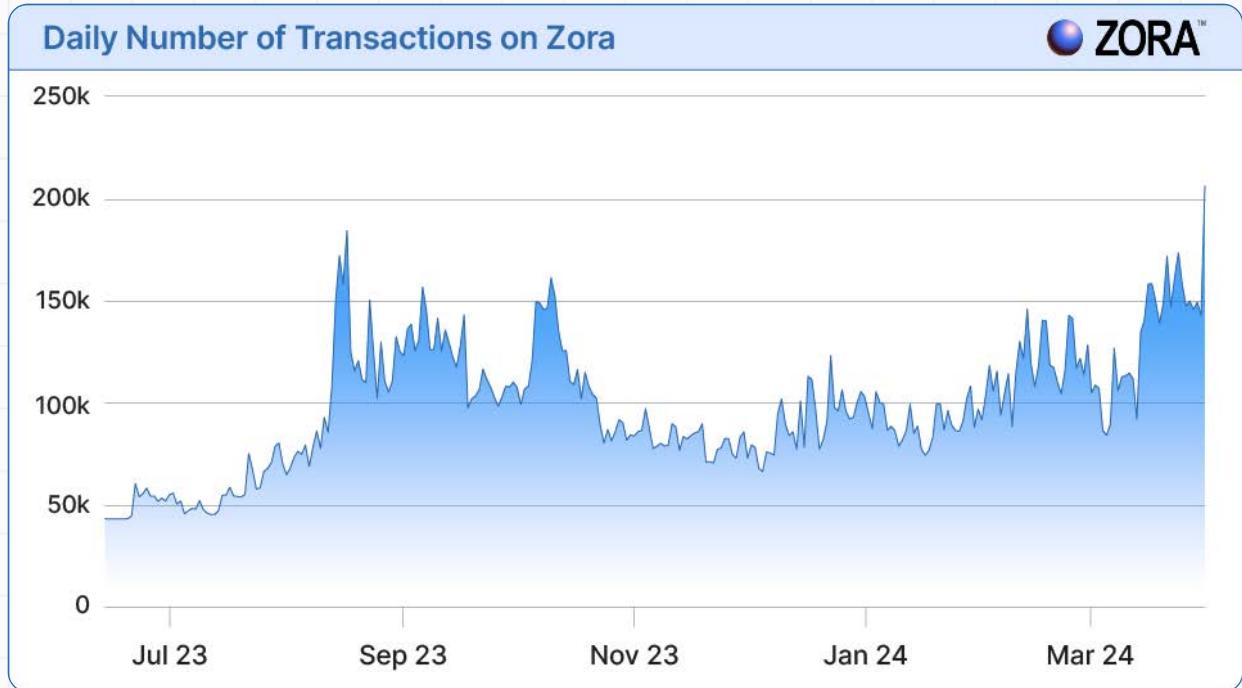
Zora Network is the first NFT-focused Layer 2 optimistic network built using the OP stack. It was launched in mid-2023 by the Zora team, the team behind the popular NFT platform, focusing on creator royalties and providing creators and brands with a place to capture a share of the resale value of their work. The platform raised over \$60 million and reached over 100K MAU before deciding to launch its own chain.

In their bid to make it even easier for creators and artists to publish and sell their creations on-chain, the team has decided to launch a specialized application-specific chain primarily for the Zora NFT minting and marketplace protocol and the Zora platform. As such, it features several key designs favoring creators:

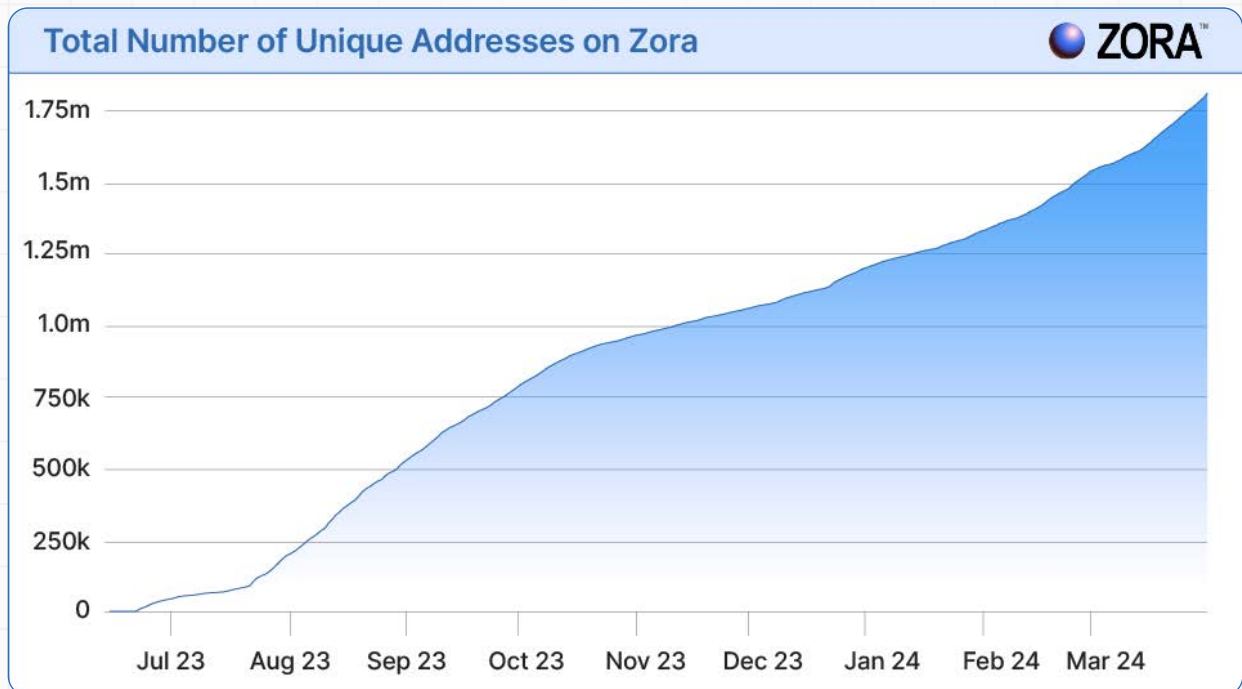
- **Interoperability** with other EVM chains and platforms so that the NFTs minted on the Zora network can be traded on other platforms, such as OpenSea
- **Community engagement** by providing tools for creators and collectors to interact and trade
- **Community governance** as the Zora community can engage in governance decisions on the protocol level
- **Developer engagement** as Zora offers developers to interact with the rollup smart contracts, APIs, and tools to build their own dapps

Zora Network provides a fast, cost-efficient, and scalable solution for the NFT economy. By moving the NFT transactions off-chain, it alleviates the transactional burden on the Ethereum network. According to data from growthpie, since the end of 2023, the number of active addresses has been steadily growing (50K), along with the number of transactions (<100K) and the total TVL (\$21M).

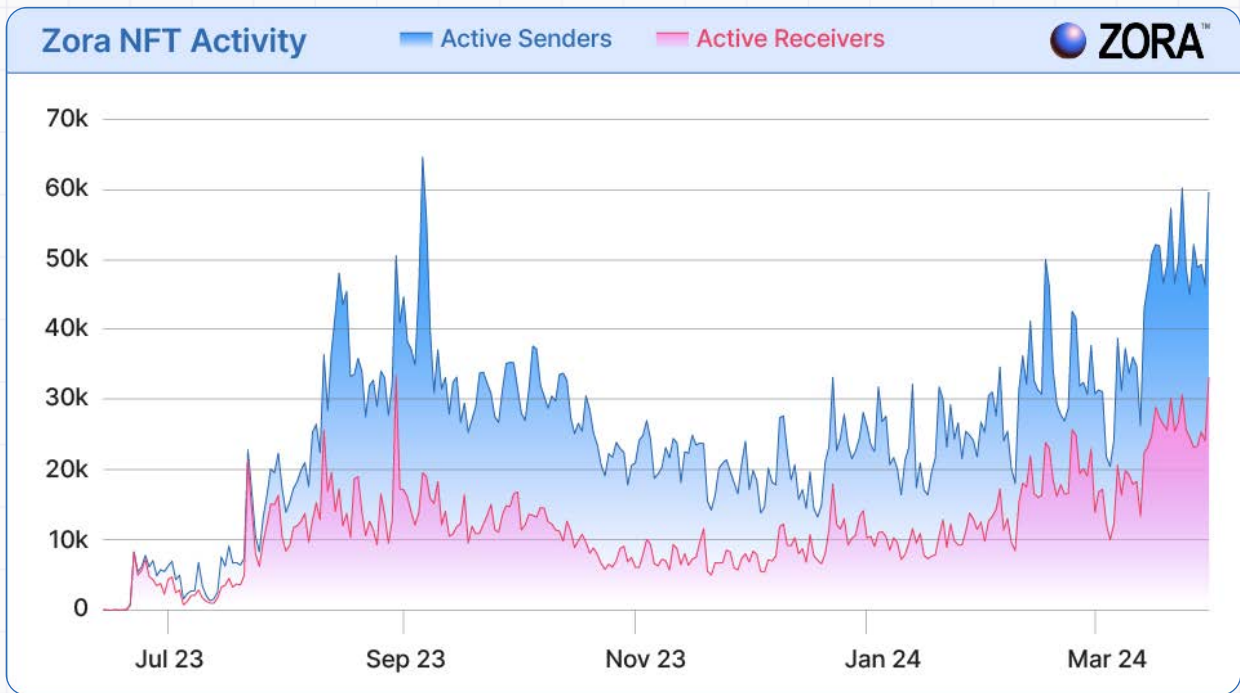
The first creator-centric L2 rollup



Daily Number of Transactions on Zora: Following the Dencun upgrade, the daily number of transactions on Zora crossed 200K for the first time at the end of March 2024. Zora’s on-chain usage metrics have steadily risen since the start of the year. The transaction costs on the network have substantially decreased, dropping from \$0.1-0.7 to less than \$0.02, making Zora one of the biggest benefactors of the rollup-centric update.



Total Number of Unique Addresses on Zora: Zora Network is going through stable and consistent growth in the total number of active creators. The daily number of active addresses is on the rise since the start of the year, recording a significant increase following the Dencun upgrade. Since the upgrade took place, fees on Zora have dropped below \$0.01 making its NFT ecosystem the biggest benefactor among optimistic rollups.



Zora NFT Activity: Creators are creating and sending new NFTs on Zora fairly consistently since the network's launch. Going beyond the general metric of active addresses, both the number of active creators and the number of collectors are expanding, especially after the Dencun upgrade.



OVER 10K FORKS
WERE CREATED ON
BLAST SINCE ITS
LAUNCH.

Blast

Blast is a Layer 2 optimistic network built on top of Ethereum, launched by the team that achieved success with Blur, one of the most popular NFT marketplaces. The idea behind Blast was in creating yield-focused passive income ecosystem, earning users yield in ETH, USDC, USDT, and DAI. It's the first L2 solely focused on generating yield through auto-rebasing mechanisms, L1 staking, and collaboration with real-world asset protocols.

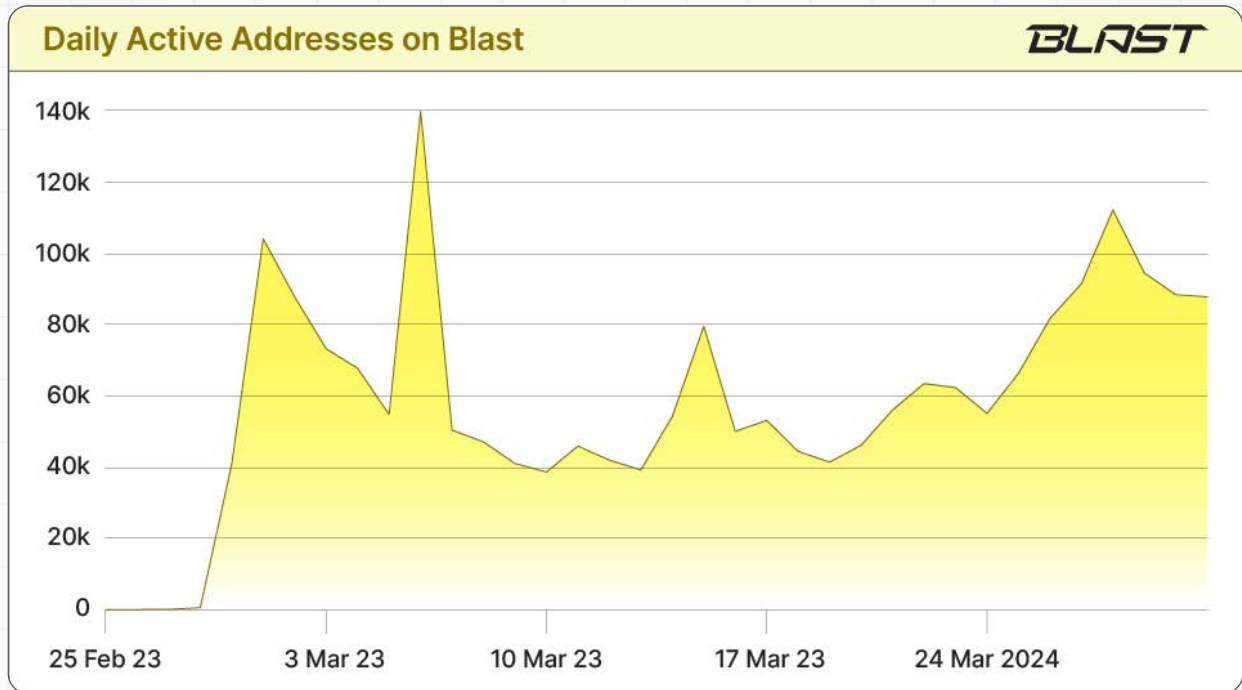
The team behind Blur bootstrapped the development of Blast by offering users to bridge assets and deposit funds in a multisig wallet, resulting in the highest bridged amount even prior to launching the mainnet blockchain. The key difference is that it's enough for users to just bridge assets to the Blast ecosystem and automatically start generating yield. This is why Blast marketed itself as the L2 that helps users earn more yield/ETH/USD.

Yield generation is based on two key components. First, it comes from users locking their ETH to support network's security and operations, receiving rewards in the form of more ETH. Blast is the first rollup directly passing the staking yield to users. Second, the stablecoins bridged to Blast are automatically deposited to Treasury Bill protocols, such as the new MakerDAO vaults.

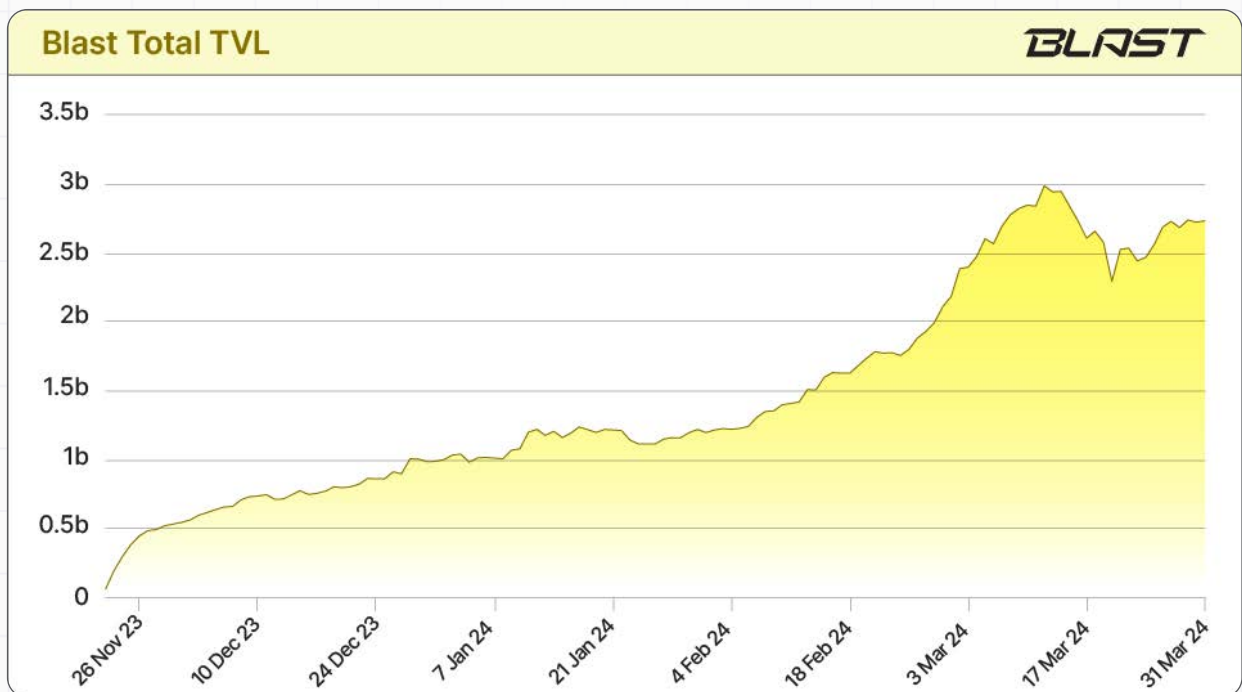
Interestingly, Blast decided to incentivize dapp development on the network by positioning itself as a platform for developers, distributing 100% of gas fees revenue, as well as an additional BLAST token airdrop bonus. With a growing DeFi ecosystem in a month since the launch, the network is on a positive trajectory.

Blast is backed by Paradigm, developed by seasoned developers, had a massive marketing launch campaign, and it turned out to be one of the most successful Layer 2 launches so far.

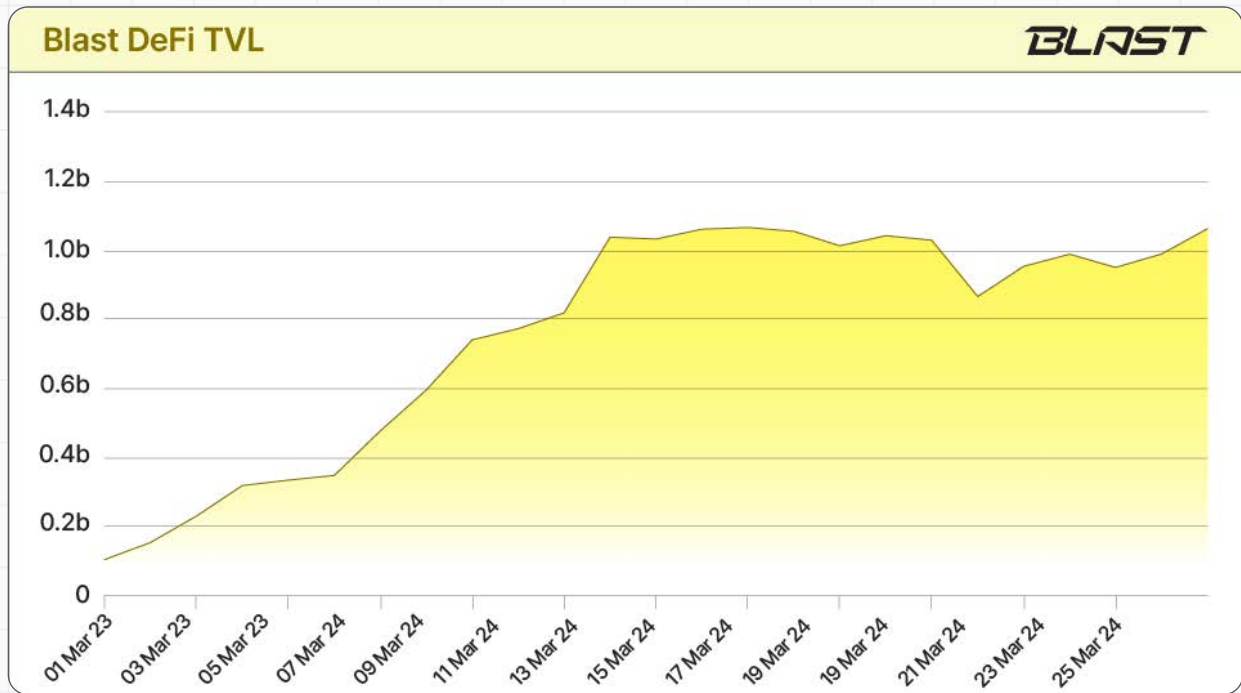
The first yield-native optimistic rollup



Daily Active Addresses on Blast: With the Blast network launching at the end of February 2024, users that bridged their assets in the months before the mainnet launch were able to make use of their assets as Blast’s DeFi dapp ecosystem sprang with the spring of 2024.



Blast Total TVL: In November 2023, Blast enabled the bridging of assets to the yield network, via a series of incentive campaigns, including the promise for an airdrop. According to L2BEAT, over 75% of total assets on the Blast network were canonically bridged since bridging was enabled. The rest is divided among the many recently launched dapps offering new and innovative yield opportunities.



Blast DeFi TVL: Blast's DeFi ecosystem is rapidly growing given the fact that the optimistic rollup network was officially launched a month ago. Numerous DeFi protocols have launched in their bid to try and capture a part of Blast's impressive amount of bridged TVL.

Projects driving on-chain activity on Blast

Blast has achieved some impressive results, becoming one of the most active Layer 2 networks, especially in terms of the deposits before a live mainnet. According to data gathered from DefiLlama, Blast attracted over \$2B in bridged assets from over 180K users prior to its launch. At the end of March, Blast's TVL stood at \$1.2B, and bridged TVL at \$2.5B, with over 450K ETH, 140K stETH, and 160M stablecoin tokens. Blast is averaging 309K daily transactions from 50K average daily active users.

Currently, most notable projects driving up additional activity on Blast include Thruster (\$278M TVL), Blast's core liquidity and DEX protocol, Ring Exchange (\$249M TVL), the leading decentralized exchange on the network, Pac Finance (\$237M TVL), a self-repaying lending protocol forked from Aave, and Orbit protocol (\$217M TVL), decentralized liquidity protocol enabling lending and borrowing of Blast assets.

→ Chapter 04

Tooling availability

The established optimistic rollup ecosystem has a significant user base, thriving community, large core developer teams, and significant number of builders devoted to their development. Most, if not all, developer tools are available and support these ecosystems, with several RaaS providers offering additional layer of support.













































Tooling availability helps overcome fragmentation and improves interoperability and standardization, for which important strides have already been made with the announcement and creation of new rollup frameworks. Relying on the same set of tools across Layer 2 solutions helps dapp developers navigate the the ever-evolving multichain landscape.

For now, it seems that it takes some time for tools to provide support to the new optimistic rollups and Layer 2 solutions in general, although that challenge remains to be far less of an issue compared to zk-rollups and alternative Layer 1 networks.

Tooling availability across all optimistic rollups

The table below provides an overview of the tooling and infrastructure components with their support availability on optimistic rollup networks. The chart comes with an editable sheet that will be updated to reflect the most recent industry data.

[SHEET FOR ALL NETWORKS→](#)

	 ARBITRUM	 OPTIMISM	 opBNB	 BASE	 MANTLE	 BOBO	 ZORA™	 BLAST
 TENDERLY	●	●	●	●	●	●	●	●
 CHAINLINK	●	●	●	●	✗	✗	✗	✗
 GELATO	●	●	●	●	✗	✗	●	●
 THIRDWEB	●	●	●	●	●	●	●	●
 THE GRAPH	●	●	●	●	✗	●	●	●
 METAMASK	●	●	●	●	●	●	●	●
 OX	●	●	●	●	✗	✗	✗	✗
 QUICKNODE	●	●	✗	●	✗	✗	✗	●
 ANKR	●	●	●	●	●	✗	✗	●
 CHAINSTACK	●	●	✗	●	✗	✗	✗	✗
 INFURA	●	●	✗	●	✗	✗	✗	●
 BLOCKSCOUT	●	●	●	●	●	●	●	●
 LAYERZERO	●	●	●	●	●	✗	●	●
 LI.FI	●	●	●	●	✗	●	✗	✗
 AXELAR	●	●	✗	●	●	✗	●	●
 INSTADAPP	●	●	✗	●	✗	✗	✗	✗
 DUNE	●	●	✗	●	✗	✗	●	●
 SAFE	●	●	✗	●	✗	✗	●	✗
 ZERION	●	●	✗	●	✗	✗	●	●
 HARDHAT	●	●	●	●	●	●	●	●
 FOUNDRY	●	●	●	●	●	●	●	●
 ALCHEMY	●	●	✗	●	✗	✗	✗	✗
 SCAFFOLDETH	●	●	●	●	✗	✗	✗	✗
 OPENZEPELIN	●	●	✗	●	●	✗	✗	✗
 MORALIS	●	●	✗	●	✗	✗	✗	✗
 BLOCKDAEMON	✗	●	✗	●	✗	✗	✗	✗
 BLOCKJOY	●	✗	●	✗	✗	✗	✗	✗
 GETBLOCK	●	●	✗	●	✗	✗	✗	●
 POKT	●	●	✗	●	✗	●	✗	✗
 ALLNODES	●	●	●	●	●	✗	✗	✗
 NOWNODES	●	●	✗	●	✗	✗	✗	✗
 ENSO	●	●	✗	●	✗	✗	✗	✗
 GOLDSKEY	●	●	●	●	●	●	●	●
 NODEREAL	●	●	●	●	✗	✗	✗	✗
 HYPERLANE	●	●	✗	●	✗	✗	✗	✗
 FLAIR	●	●	●	●	●	●	●	●

Networks comparison


The table below provides a comparison of optimistic rollup networks featured in the report, with up-to-date data from Q1 2024.

DeFi TVL and market share are provided based on the data from DefiLlama. The deployed contracts, average number of transaction, average transaction cost before and after the Dencun upgrade, as well as the average number of daily active addresses are based on on-chain data and reliable data pulled from Dune.

The maximum recorded daily number of transactions per second is a metric recorded and tracked by L2BEAT.

It's important to highlight that, while for all of the listed networks the data is pulled from reliable, external sources, most of the data related to opBNB is based on the official opBNB explorer.

Some of the fields are missing due to the limitations in data availability and/or accuracy.

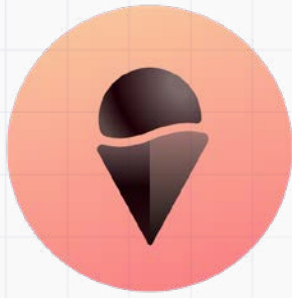
	 ARBITRUM	 OPTIMISM	 opBNB	 BASE	 MANTLE	 BOBA	 ZORA	 BLAST
DEFI TVL (\$)	4.22B	1.06B	18.17M	1.14B	272M	7M	1.56M	1.32B
MARKET SHARE	52.27%	13.22%	0.22%	14.22%	3.38%	0.09%	0.19%	16.40%
DEPLOYED CONTRACTS	4579840	13301961	2506999	62051555	818986	N/A	N/A	N/A
MAX TPS	58.97	11.29	826.06	29.88	25.47	0.29	1.89	6.98
AVG TX NUMBER	796.077	391.945	3.108.890	484.484	178.995	83.596	97.878	339.987
AVG TX COST	0.16	0.34	N/A	0.29	0.11	N/A	0.33	N/A
AVG TX COST DENCUN	0.04	0.08	N/A	0.52	0.03	N/A	0.01	N/A
AVG ACTIVE ADDRESSES	180.201	84.691	2.074.244	127.386	27.218	251	36.282	56.878

Tooling providers' insights and essential tools

The infrastructure and developer tooling landscape has greatly evolved between Web3 development cycles. Many providers achieved their product-market fit by offering their users specific developer tools across the multichain landscape. Infrastructure and tooling providers play a crucial role in supporting the adoption of new networks and onboarding dapp developers.

Tooling portability as well as dapp development and deployment are a lot less of a challenge within the Ethereum EVM ecosystem compared to significant differences between different VM solutions. Hence, it's no wonder that there is a significant overlap between deployers across optimistic rollups, Ethereum Mainnet, and other EVM-compatible blockchain networks.

In this chapter, some of the key infrastructure and tooling providers and cross-chain communication protocols share their thoughts on the current developments within the optimistic rollup landscape.



Gelato

With over seven million transaction executions across over 35 networks and rollups, including Optimism, Arbitrum, Base, Zora, and Blast, more than 500 projects use the Gelato suite of Web3 services day-to-day to enable mission-critical core protocol designs and features. The projects span key verticals such as DeFi, infrastructure, gaming, and NFT and include PancakeSwap, Safe, Lyra, Astar, Pyth, Rarible, and many more.

Some notable projects per network include:

- **Optimism:** Superfluid Finance, Abracadabra, Arrakis, Velodrome, and more.
- **Arbitrum:** Beefy Finance, Abracadabra, Perennial, and others.
- **Base:** Supa, Vega Protocol, Thalesmarket, among others.
- **Blast:** Redstone, LooksRare, NFT Treasure, and additional projects.

When it comes to on-chain activity on specific chains, Gelato has seen growth across various L2 solutions:

- Arbitrum executed over 11M Web3 Function tasks YTD.
- Base closely follows Arbitrum in Web3 Functions, with 10M tasks YTD.
- With over 130K active task in less than a month, Blast overtakes Arbitrum and Base as a top network based on the number of executed transactions.
- When it comes to Relay-related data, Arbitrum leads with over 300K transactions YTD.
- Optimism ranks second with over 90K transactions YTD.

Gelato's Rollup-as-a-Service

Gelato enables seamless deployment of custom chains, fully integrated with Web3 tools and services. Founders and developers from the leading Web3 projects use Gelato to build and scale Ethereum rollups and applications, relying on industry-standard Web3 infrastructure and service solutions under one roof.

Gelato's Rollup-as-a-Service leverages both Arbitrum and Optimism tech stacks, enabling developers to easily deploy production-grade L2s natively integrated with essential components, such as oracles, bridges, data indexers, account abstraction, as well as integral infrastructure providers such as Tenderly.

With an increasing demand for optimistic rollups, Gelato has several new chains set to launch in the upcoming weeks, including, PlayBlock, a Layer 3 rollup built on the Arbitrum Orbit stack, Re.al, another Layer 2 solution based on the Arbitrum Orbit stack, and Lisk, a Layer 2 solution built using the OP stack.

Some of the key features of the Galato's RaaS include:

- **Core functionalities** such as production-grade environments, automatic upgrades, and performance and profitability metrics.
- **Custom configuration options** that include decentralized sequencing, alternative DA, and native gas tokens.
- **Network infrastructure** such as native bridges, testnet faucets, and over 30 integration partners.

Rollup trend highlights

The Gelato team points out several rollup-related trends:

- **Rollup restaking:** The concept involves repurposing staked assets to secure additional blockchains and protocols, providing decentralized sequencing, verification, and faster finality services.
- **Gaming chains:** The deployment of Layer 2 solutions is a crucial trend in the on-chain gaming space. Developers are striving to tackle scalability issues and improve the user experience by incorporating zero-gas chains, native gas tokens, and native account abstraction. These advancements aim to achieve full chain abstraction, with user-experience (UX) on par with Web2 without compromising the security and decentralization of the Ethereum network.
- **Rising derivatives:** Derivatives perpetuals, particularly decentralized perpetual future exchanges (perp DEXs), are experiencing a significant trend toward Layer 2 scaling solutions. This shift is driven by the need for improved performance and scalability in on-chain trading.

The growth of perp DEXs, facilitated by Layer 2 solutions, showcases how scaling core infrastructure leads to enhanced functionality and increased trading volumes. Layer 2 scaling has enabled the rapid expansion of perp DEXs by addressing issues like slow execution speeds and high gas costs, making decentralized derivatives trading more efficient and accessible.

- **Bitcoin L2s and EVMs:** Bitcoin Layer 2s aim to scale the Bitcoin blockchain and Bitcoin as a gas-token by developing complementary EVM execution layers that can handle more transactions and advanced operations than the main Bitcoin network. This allows projects to settle on Bitcoin, yet provide access to EVM capabilities, such as running smart contracts, which are not natively supported on the Bitcoin blockchain.
- **Solana L2s:** Solana Layer 2s aim to scale the Solana as a settlement layer. This allows projects to settle on Solana, yet fully tap into EVM networks and growing ecosystems. Gelato supports the integration of the Solana blockchain as a settlement layer. Solana's Layer 2 solutions aim to enhance scalability and support EVM compatibility, offering developers high throughput and low-cost transactions.



Chainlink

Chainlink is the industry-leading decentralized oracle network that bridges the gap between smart contracts on blockchain platforms and real-world data, enabling them to interact seamlessly with external data sources, APIs, and traditional systems. Smart contracts, while efficient and tamper-proof, lack the capability to access data outside the blockchain environment on their own. This limitation inhibits their use cases in areas requiring real-time and accurate data feeds, such as finance, insurance, supply chain, and gaming.

Chainlink solves this problem by providing a decentralized infrastructure of nodes, or oracles, that securely fetch and deliver external data to smart contracts. These nodes source data from multiple trusted sources, aggregate it, and deliver it on-chain in a manner that is verifiable and resistant to manipulation. This ensures the integrity and reliability of the data inputs, crucial for executing trustless and transparent agreements on the blockchain.

The architecture of Chainlink allows for customization and flexibility, supporting a wide range of data formats and APIs, including web APIs, IoT devices, market data feeds, and more. Additionally, Chainlink employs a reputation system and cryptographic techniques to incentivize oracle operators to provide accurate data and penalize malicious behavior, enhancing the network's security and reliability.

Chainlink's capabilities extend beyond data delivery, enabling the execution of complex smart contracts that rely on external events or conditions. For example, insurance contracts can automatically trigger payouts based on weather data, supply chain contracts can update inventory levels in real-time, and decentralized finance (DeFi) applications can settle loan agreements using up-to-date market prices.

The Chainlink network operates on Ethereum, the leading smart contract platform, and is designed to be blockchain-agnostic, allowing integration with various blockchain ecosystems. Its native cryptocurrency, LINK, serves as the utility token for paying node operators and accessing advanced features within the network.

Chainlink is the leading oracle provider in the Web3 ecosystem and is considered one of the essential and key infrastructure components of any blockchain. So far it support Arbitrum (94 projects), Optimism (46 projects), Base (5 projects), and opBNB (329 projects*), from our list of eight chosen optimistic rollups.

*opBNB is connected directly and featured as a part of the BNB chain.



thirdweb

thirdweb is a full-stack, open-source Web3 infrastructure and development platform providing a suite of frontend, backend, and on-chain tools to build dapps on any EVM blockchain. It simplifies and speeds up dapp development with a no-code platform allowing developers to create, deploy, and manage smart contracts on supported blockchain networks. thirdweb's mission is in fact to simplify and abstract numerous Web3 complexities and offer a unified developer experience. It's one of the essential infrastructure products in the Web3 ecosystem.

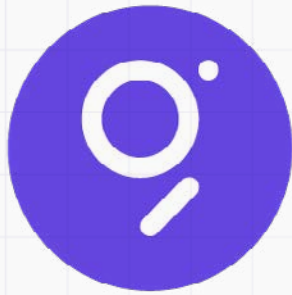
The thirdweb platform supports all EVM blockchain networks, and, therefore, provides RPC nodes and various tools for working with smart contracts on all of the optimistic rollups listed in the report. Some of the key thirdweb features include:

- Building, deploying, and interacting with smart contracts, with a Solidity SDK and a library of pre-built contracts and extensions
- Open-source HTTP server for smart contract interactions on any EVM chain
- Client SDKs for wallets, fiat and cross-chain crypto payments, and account abstraction
- Developer tools such as dashboards and CLI

Some of the featured thirdweb use-cases are:

- Onboarding Web2 users to Web3 products, abstracting away blockchain complexities
- Building dapps with infrastructure, smart contracts, wallets, and payment tools
- Developing Web3 on-chain games on Unreal Engine, Unity, and other platforms
- Creating Web3 loyalty programs and token airdrops
- Deploying marketplace contracts for dapps and games on any EVM chain
- NFT minting, deploying, and distributing with a few lines of code

At the time of writing, over 70K+ Web3 developers are relying on thirdweb's tools for building dapps and games. Over 2M smart contracts have been deployed using the famous platform, with over 1M transactions being executed monthly. The platform supports an impressive number of blockchain networks and over 200 Web3 wallets.



The Graph

As the indexing and query layer of Web3, The Graph plays an important role in enabling the decentralized internet's multichain future, which includes adding support for more optimistic rollups onto The Graph Network. The Graph enables builders across optimistic rollups to create applications powered by a foundation of decentralized data, creating performant experiences while avoiding vendor lock-in.

The Graph has recently enabled network support for Base, Blast, and Boba alongside the already supported Arbitrum One and OP Mainnet networks. The addition of Base, Blast, and Boba was made possible by the upgrade Indexer, a technical release that brought many of The Graph's hosted service chains to the decentralized network.

Developers building with decentralized data powered by The Graph Network are growing rapidly. Today, 1,197 unique projects rely on active subgraphs served by The Graph Network. As adoption of optimistic rollups continues, a growing number of developers will power their dapps' data with subgraphs on The Graph Network, ensuring robust, reliable, and censorship-resistant access to blockchain data.

The Graph Network enables a multichain future by rapidly expanding subgraph support for a variety of different blockchain networks. Optimistic rollup ecosystems seeking subgraph support are encouraged to follow The Graph Foundation's [Chain Integration Process](#).

"The Graph has supported optimistic rollups since the launch of Optimism Mainnet in 2021. Scalability and interoperability are integral traits to Web3 – The Graph is here to support builders scaling Web3 who need access to performant, decentralized and censorship-resistant data pipelines. Today, The Graph's decentralized network supports data indexing across Arbitrum One, Base, Blast, Boba and Optimism. Part of The Graph ecosystem's development philosophy is the belief that tooling availability on optimistic rollups is crucial for accelerating innovation without the limitations of high gas fees on L1. As The Graph continues multichain expansion, we are prepared to support zk and optimistic rollups thanks to The Graph Foundation's Chain Integration Process." – Tegan Kline, CEO of Edge & Node.



Metamask

MetaMask is an industry-known wallet solution, giving a diverse set of users easy access to a wide range of networks. Aside from choosing from a list of commonly used chains, MetaMask users can also add custom chains following a straightforward process.

Additionally, with the introduction of MetaMask Interoperability Snaps, users can interact with any network in the Web3 ecosystem, including non-EVM chains. This way, MetaMask continues to support multichain development, allowing builders to add multiple snaps for any network they're building on.



To further facilitate cross-chain communication, MetaMask supports different types of bridges in their MetaMask Portfolio dapp. Through seamless integration with Li.Fi. and Socket, the Bridge feature aggregates bridge providers such as Connect and Hop. From the rollups listed in this report, MetaMask Portfolio supports bridging assets to Optimism, Arbitrum, and Base.



Ox

Ox offers a full suite of APIs for developers to build products that support crypto swaps and trading on various chains. Both Ox Swap API, their flagship crypto trading product, and TX Relay API, their gasless trading product, support Optimism, Arbitrum, and Base out of the rollups listed in the report.

Ox users include Web3 companies and projects that build different types of products requiring swap functionalities, including wallets offering in-app swaps, portfolio managers, and dapps with token deposits. The projects are distributed across different chains, including Optimism, Arbitrum, and Base as follows, with 520, 510, and 166 of active projects on each network in Q1 2024 respectively.

CHAIN	# OF PROJECTS W/ ACTIVITY ON NETWORK IN Q1 2024	# OF PROJECTS W/ ACTIVITY ON NETWORK IN Q3 2023	% CHANGE
OPTIMISM	520	140	271.43%
 ARBITRUM	510	202	152.48%
 BASE	166	75	121.33%

Ox on-chain metrics for Optimism, Arbitrum, and Base

The Ox team highlights multiple key on-chain metrics related to these supported chains. The Dencun upgrade caused a significant rise in volume across all three L2 networks and steady growth of user activity.

- Arbitrum still attracts more DeFi natives, leading in terms of total volume (\$552M, accounting for 59.4% of L2 volume) and average trade size (\$1,907.47).
- Base saw the largest Q4 2023 to Q1 2024 growth in terms of user adoption, with an around 60% increase in unique wallets, 207.48% increase in average trade size, 515.67% increase in total volume, and 115.66% in total transactions.

- Optimism saw the largest reduction in the average gas fee per transaction (-23.02%).
- Base saw the largest increase in the average gas fee per transaction (547.40%), though still ~1% of the average gas fee on Ethereum.

“EIP-4844 marks a pivotal advancement in DeFi accessibility to mainstream users, significantly enhancing TPS on L2s and reducing per-transaction gas fees. EVM compatibility is a cornerstone of these rollups, uniting Web3 developers with users who prioritize both UX and affordability. Tools like Tenderly & 0x APIs make it possible to bring products to market across these chains and decrease the headache of maintaining a multichain multi-L2 presence and delivering on that vision.” – Duncan Townsend, 0x Smart Contract Lead



Quicknode

Providing an essential infrastructure layer for anyone building on-chain, QuickNode is utilized by a diverse range of developers, from indie devs and weekend warriors to the teams building top Web3 projects and those enabling global Web2 companies to adopt blockchain technology. Across the board, these developers and builders prioritize scalability, security, and reliability in their projects.

QuickNode's platform has experienced substantial growth across all supported networks, with a notable increase in adoption on EVM-compatible chains and Solana. This growth is bolstered by trust from industry leaders like Nansen, 1inch, Phantom, OpenSea, Magic Eden, Chainalysis, and Dune Analytics.

From the list of optimistic rollup chains featured in this report, QuickNode supports Optimism, Arbitrum One, Base, and the newly launched Blast chain. The team is also in active discussions with a number of chains leveraging the OP Stack and Arbitrum Orbits, while also working with other popular tech stacks, including Polygon CDK, zkSync Hyperchains, Cosmos SDK, and Avalanche Subnets.

QuickNode's insights on rollups

As QuickNode highlights, the market has been clear in its demand for new L2s and L3s built on existing technologies whether it's an application-specific chain (appchain) or a general-purpose chain.

Optimistic rollup chains have shown impressive growth in on-chain usage over the past year. The transaction count grew ~3.5x on these chains between Feb 2023 and Feb 2024. Additionally, there's a clear ramp in new optimistic rollup chains launching, both general-purpose and application-specific chains, with new chains like Base and Blast growing faster than anticipated.

"It's exciting to see these chains flourish, and a privilege to be able to support them and their users. We look forward to a fully on-chain future powered by the next generation of blockchain scaling solutions, and we're here to support them with the most reliable infrastructure in the market. We're also very excited about the Dencun upgrade and want to give a huge shoutout to everyone involved in its implementation. The early results are showing significantly lower fees on the optimistic rollup chains."



Ankr

As a leading Web3 developer hub, Ankr provides a comprehensive range of tools for 51 networks. Additionally, Ankr serves as a Decentralized Physical Infrastructure Network (DePIN) provider, offering a reliable and secure global node infrastructure. By supporting dapp development, blockchain scaling, staking solutions, and RaaS, Ankr is one of the key players facilitating Web3 development.

With its Rollup-as-a-Service as part of their scaling solutions, Ankr enables developers to build sidechains and rollups with fast and secure tools, supporting both optimistic and ZK rollup architecture. It merges rollup infrastructure with developer incentives via ankrETH, DePIN status, and a dual token strategy. With this approach, Ankr creates a comprehensive development setting along with a decentralized infrastructure network.

Ankr's comprehensive suite of infrastructure and RaaS solutions caters to a diverse community within the blockchain ecosystem, from emerging startups to established enterprises. Ankr's users include crypto projects and DeFi protocols, DeFi traders and liquidity providers, developers and tech entrepreneurs, blockchain investors, funds, and institutional players.

Ankr supports 40% of RPC DeFi activity across 51 blockchains. Some of the projects using Ankr to build across different chains includes BitFinex, Frax, Beefy Finance, Pendle, Ramses Exchange, WormHole, Space & Time, ZettaBlock, GoldSky, Nansen, Staking Rewards, Velodrome, Holdstation, and Omnia Tech.

Ankr offers infrastructure support for all of the networks analyzed in the report within their product suite, including Ankr RPC and Ankr RaaS.

Ankr's insights on rollups

The Ankr team points out several key trends on optimistic rollups, including:

- **Increased adoption by startups and Web3 gaming:** Startups and Web3 gaming companies are drawn to the scalability, lower transaction costs, and enhanced user experience of optimistic rollups. Particularly on networks like Arbitrum, there's been a marked increase in decentralized gaming platforms

As the Ankr team further highlights, Optimism and Arbitrum have demonstrated considerable customer traction, with developers and users alike showing a keen interest in building and participating within these ecosystems.

The recent Dencun Ethereum upgrade, with the introduction of “blobs”, has been a pivotal development. As Ankr states, the ability to provide better user experiences through lower gas costs is being recognized as a game-changer. This technological leap is not only enhancing the current L2 frameworks but is also setting a new standard for the development and deployment of decentralized applications, marking a significant improvement in economic efficiency and user experience.

“Based on these developments and market feedback, we anticipate a broader adoption of blob space across all L2 networks. This shift is expected to catalyze a migration of developers from standalone Layer 1 (L1) chains to rollup-based frameworks, driven by the allure of lower gas costs and the potential to attract a wider user base. The Dencun upgrade represents a significant milestone in Ethereum’s evolution, offering rollup developers the tools to create more efficient and user-friendly platforms.” - Kev Silk, Sr. PM. at Ankr



Chainstack

Chainstack is a blockchain infrastructure provider offering a suite of managed Web3 services. It provides tools and services to streamline the process of building, deploying, and scaling blockchain applications for businesses and developers and simplify the deployment and management of blockchain networks. Chainstack offers unified access to multichain node and data APIs, distributed computing and storage, and the ever-expanding list of services and tools to build applications across all prominent Web3 protocols.

This infrastructure provider aims to make blockchain technology more accessible by offering a user-friendly interface and abstracting much of the complexity of setting up and managing blockchain infrastructure. Its platform supports various blockchain ecosystems. In terms of optimistic rollups, Chainstack currently supports Arbitrum, Optimism, and Base.

Teams and companies relying on optimistic rollup nodes on Chainstack include RaaS providers, wallet providers, oracles, DeFi, fiat on/off ramps, analytics, and GameFi.

Chainstack highlights several key usage metrics for the top optimistic networks:

- There's a steady increase of 44.8% in the number of active optimistic rollup nodes deployed on Chainstack since June 2023.
- Since June 2023, the number of customers with active Arbitrum nodes deployed on Chainstack has increased by 15.2%.
- The number of customers with active Arbitrum nodes deployed on Chainstack increased significantly by 649% in March 2023 compared to the previous month.
- The number of active Base nodes deployed on Chainstack has significantly increased since August 2023, reaching 106%.
- Since June 2023, the number of customers with active Optimism nodes deployed on Chainstack has increased by 390%.



Infura

Infura is an industry node provider, offering support to individual developers and teams across different verticals and chains, including optimistic rollups. To ensure easy access to a full range of services in the multichain ecosystem, Infura is a core contributor to the collaborative Decentralized Infrastructure Network (DIN).

When it comes to the rollups analyzed in this report, Infura supports free tier access to Optimism and Arbitrum and custom tier access to Base. Additionally, Infura enables support for the Blast L2 Mainnet and Sepolia testnet via DIN. Additionally, the Infura team noticed a significant spike in optimistic rollup requests, signalling increased on-chain activity on these solutions.

“We believe strongly that the future is multichain, so we are bullish on optimistic rollups as an important component of a diverse, healthy ecosystem. We are here to support builders with Infura and DIN and to continue to push toward greater decentralization of Web3 infrastructure. This is how we unlock new use cases, onboard the next billion and transition to a world of self-sovereignty and a more equitable distribution of value and ownership.” - Tony Chen, VP of Product, Infura

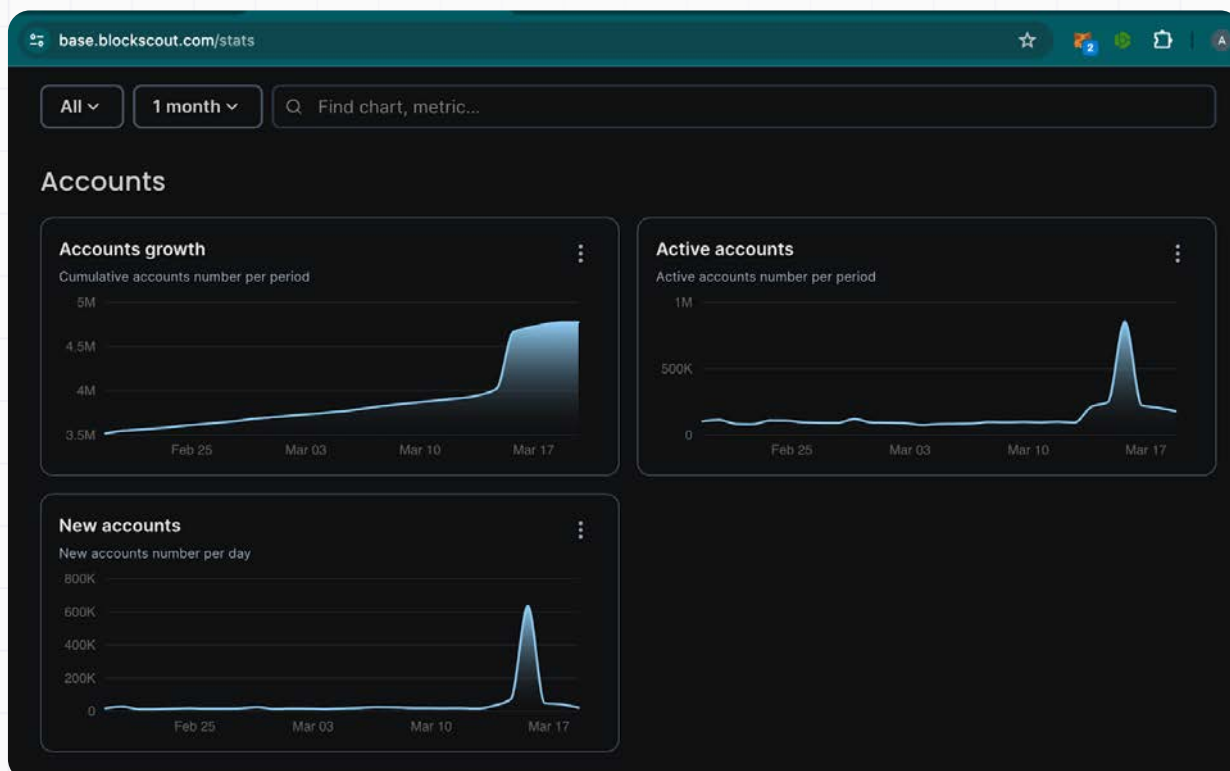


Blockscout

As one of the essential explorers in the industry, Blockscout enables seamless integration and deployment of rollup solutions. Since Blockscout is open source, any rollup can deploy Blockscout within its own infrastructure setup.

The Blockscout team runs their own instances of [OP Mainnet](#) and its [Sepolia testnet](#), using them as a showcase for the team's latest explorer developments. On these instances, users can explore the latest versions of Blockscout, along with features such as gas tracker, advanced statistics, and the DAppscout Apps Marketplace.

Blockscout also runs [Base](#) instances where usage has been growing in recent months. The recent spikes in new account activity on Base have led to a corresponding bump in daily explorer usage. The DAppscout Marketplace on Base is also gaining traction as a safe and convenient place to connect with various dapps and interact directly within the interface using a single connected wallet.



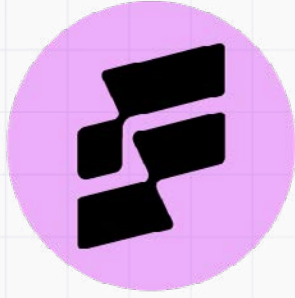
New account spike on Base

The Blockscout team also highlights that the usage of the Sepolia instances is very high on both [Optimism](#) and [Base](#) relative to mainnet usage. This suggests that a large portion of users are developers who tend to use Blockscout for use cases such as verifying contracts and connecting to the Blockscout APIs. Additionally, the Blockscout MyAccount creation has been growing on all chains as developers can access free API tags, verify contract ownership, and customize the explorer with tags and other dev-centric features.

[Mantle](#), [Zora](#), and [Arbitrum](#) instances run their own Blockscout explorers, with more rollups choosing to launch with Blockscout as their primary explorer. Standard tooling across chains helps users and developers quickly acclimate to the new environment, and a familiar and useful explorer interface saves time and shortens the learning curve, creating a more unified multichain experience.

As the team further points out, with the Dencun upgrade, optimistic rollup usage is only set to increase. Blockscout supports EIP-4844 on Ethereum, and a steady stream of blobs is coming in from rollups, including Optimism, Base, and Arbitrum. While blobs are only stored on-chain temporarily, Blockscout keeps all blobs indefinitely, providing a valuable catalogue of historical rollup data.

“Optimistic rollups are growing in importance as transaction fees drop on larger rollups and new rollups proliferate throughout the ecosystem. Tools that tie these environments together are absolutely necessary to create cohesion and prevent a fragmented user experience. Blockscout is one of these tools, providing a full-featured and open-source explorer for multichain users and developers.” - Ulyana Skladchikova, Head of Product at Blockscout



LI.FI.

LI.FI. is a foundational cross-chain bridge and DEX aggregator connecting over 100 blockchain networks and more than half of all bridges in the ecosystem, with a focus on interoperability. Through its chain-agnostic approach, it acts as a middle layer between blockchains and decentralized applications by abstracting away liquidity pools on-chain and the bridges between them. It greatly simplifies swapping and bridging by connecting bridges to DEXes and DEX aggregators, allowing for a greater number of swap pairs.

LI.FI's bridge aggregation vision is the cornerstone of the multichain future and Ethereum scaling by providing users with more choices in finding the fastest and most cost-efficient route for their bridging activities. It connects all the native chain bridges and bridge projects such as Hop, Celer cBridge, Hyphen, Across, Stargate, and Connex, among others.

LI.FI. boasts impressive stats with over \$5B in volume and over 5M+ transactions taking place between 140+ integrations, including Robinhood, Crypto.com, MetaMask, Brave, Binance, Hyperliquid, OpenSea, and DeFi Saver, to name a few. Currently, out of all the optimistic rollups, it supports Arbitrum, Optimism, Base, Boba, and Metis with opBNB and Mantle coming soon.

The leading aggregation protocol provides its customers with a comprehensive product suite:

- **An upgradeable smart contract:** abstracting the communication between different bridges.
- **An intelligent routing backend:** determining the best route for any on-chain or off-chain cross-chain swaps.
- **JavaScript Software Development Kit (SDK):** The [LI.FI SDK](#) integrates the smart contract and the routing backend.
- **A customizable widget:** helping developers provide a pleasant user experience through our customizable widget.

"Optimistic Rollups are at the heart of Ethereum's scaling strategy, now regularly surpassing Ethereum itself in daily onchain activity. However, it's time for optimistic rollup tech to mature, as most still lack fraud proofs despite securing billions in user funds. Their evolution is critical for Ethereum's scalability, and equally, for the security of the entire network." - Philipp Zentner, Co-Founder & CEO LI.FI



Axelar

Axelar is a cross-chain communication and bridge protocol. It acts as an overlay decentralized network delivering secure communication and backend interoperability between over 50+ blockchain networks across the EVM and Cosmos ecosystems. Powered by a decentralized open network of validators, Axelar is a permissionless, consensus-agnostic, proof-of-stake blockchain that connects other blockchain networks, builders, dapps, and users.

The Axelar tech stack has three main layers: application-layer APIs and SDK; Layer-1 Gateways that execute and receive messages; and the network itself, a dynamic validator set connected by permissionless protocols. Alongside the core offering of Cross-Chain Gateway Protocol (CCGP), and Cross-Chain Transfer Protocol (CCTP), Axelar also provides a bridge app, [satellite.money](#), for transferring assets cross-chain.

It features a sprawling ecosystem of partners across DeFi protocols, stablecoins, wallets, NFTs, and Web3 games. Axelar partnered with Circle to enable composable liquidity by relying on its stablecoin USDC. Additional popular use cases include token transfer, cross-chain governance, and cross-chain NFTs.

Axelar is heavily focused on scaling the Ethereum network by onboarding new EVM-based networks. At the moment, among optimistic rollups, Axelar supports Arbitrum, Optimism, Base, Mantle, and Blast. Across its entire connected ecosystem, Axelar has executed over 1.5M transactions and \$8B in volume.



LayerZero

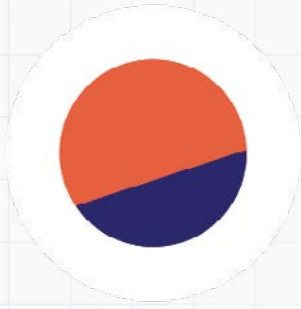
LayerZero is a permissionless, censorship-resistant, immutable protocol connecting blockchain networks. Using LayerZero, developers can send and compose arbitrary messages across chains while preserving full control over their application's security.

LayerZero has been live since 2021. Since its inception, LayerZero has facilitated 125 million messages across 64 networks, transferring over \$50B+ in value. Roughly 50,000 contracts have been deployed on LayerZero, making it one of Web3's most popular infrastructure platforms. Over 250 projects utilize LayerZero for a range of use cases, including Stargate, Radiant Capital, Ethena, Project Guardian (Onyx by JP Morgan, Wisdom Tree), TapiocaDAO, Abracadabra, Angle, Curve Finance, Holograph, PancakeSwap, Prime Protocol, TraderJoe, and KelpDAO, among others.

OP Mainnet, Arbitrum One, Base, Mantle, Zora, opBNB, and Blast all include LayerZero Endpoints, allowing developers to send/receive messages between any LayerZero-supported chain. Arbitrum, Optimism, and Base are in the top five networks by message volume in 2024. For example, LayerZero has facilitated millions of inbound messages to optimistic rollups since January 1, 2024:

- Arbitrum: 1.9 million
- Optimism: 1.4 million
- Base: 2 million
- Mantle: 452k
- Zora: 305k
- opBNB: 450K
- Blast: 42K

“By leveraging the EVM-compatible tooling and cheap block space available on chains like Optimism and Arbitrum, the crypto industry is witnessing a significant decrease in transaction fees and processing times, directly improving the user and developer experience. Optimistic rollups as a core feature to Ethereum’s scaling strategy underscores the importance of LayerZero’s role in providing seamless interoperability, ensuring that scalability does not come at the expense of security or decentralization.” - Mark Murdock, Sr. Researcher; Mitch Schneider, Researcher



Dune

Dune Analytics is a pioneering, industry-leading, and essential data analytics platform in the Web3 ecosystem. Founded on the principle of democratizing access to blockchain insights, Dune offers a comprehensive suite of tools tailored for developers, researchers, and analysts. Its mission is to make crypto data accessible. Using Dune, developers can query, visualize, and export organized, decoded, and human-readable 500TB of data across 25+ chains of 1.5M+ datasets. The Web3 community has created over 750,000 queries and 100,000 dashboards tracking essential metrics.

In terms of optimistic rollups, Dune currently supports Arbitrum, Optimism, Base, Zora, and Blast and offers highly detailed and in-depth data visualizations covering key blockchain metrics and on-chain project data.

Key Dune features include:

- **Customizable dashboards:** Dune Analytics empowers users to create personalized dashboards, allowing them to visualize and monitor key on-chain metrics in real-time.
- **SQL query interface:** At the core of Dune lies its powerful SQL query interface, enabling users to interact with blockchain data in a familiar and intuitive manner.
- **Shared queries and dashboards:** Collaboration is central to Dune Analytics' ethos. Users can effortlessly share their queries and dashboards with peers.
- **Integration with Ethereum smart contracts:** Dune Analytics seamlessly integrates with Ethereum smart contracts, providing users with direct access to on-chain data.
- **Community-driven development:** Dune Analytics thrives on community participation and feedback. The platform actively solicits input from users, continuously refining its features and functionality to the evolving needs of the Web3 community.

Dune data has been instrumental in preparing this report. By fostering collaboration, democratizing access to on-chain data, and championing community-driven development, Dune Analytics continues to advance the decentralized and multichain future.

→ Chapter 06

Technical developments

The developer community has been working hard to support the deployment of new rollups, enhance their efficiency and performance, and preserve their security. Aside from the growing number of rollups, these efforts are also reflected in technological advancements related to system modularity. A growing number of projects is tackling specific layer challenges.

Another key aspect of the rollup-centric multichain roadmap for scaling Ethereum is the cross-chain communication, enabling different type of data to be transferred between chains. This section touches upon the importance of cross-chain communication and bridging protocols.

The modular rollup stack

With increasing appchain and rollup adoption, we can see significant modularity improvements and experimentation. For instance, recently launched DA layers, Celestia and EigenDA, provide low-cost options for appchains to publish data, which in return allows for faster and easier rollup deployments.

As the ecosystem continues to mature, we can expect more experimentation on top of DA layers, as well as with other modular components. With highly specialized and flexible modules, RaaS providers can offer a diverse rollup tech stack for new chains.

Builders can choose between different operational components, ensuring their solutions' optimal efficiency and performance. In addition to DA layers, they can decide on the execution engine to power their rollups and appchains, the sequencer and validators, and the fee market structures.

By optimizing rollup performance, advancements in modularity will ultimately affect the user experience on the existing and new chains, supporting their adoption and ecosystem growth.

Cross-rollup communication

With optimistic rollups, and other L2s and appchains, showing significant upward trends, seamless cross-chain communication becomes essential in the multichain ecosystem. Therefore, more than a few projects focus on building efficient cross-chain communication channels to bring greater efficiency and security across chains while improving user experience.

Bridges

General cross-chain bridges enable L1<>L2 transactions, with around one week for finality in the case of optimistic rollups. Some of the notable bridges supporting rollups include LayerZero (~\$577M TVL), Wormhole (~\$581M TVL), Axelar (~\$151M TVL), Across (~\$52M TVL), Hop (~\$49M TVL), and Connex (~\$398M TVL), to name just a few. In March 2024, the total volume of bridged assets across most active bridges in the rollup ecosystem crossed \$10B.

However, with general L1<>L2 bridges, cross-rollup communication is limited, working only between these two layers. In the multichain ecosystem, this type of communication poses limitations, which has prompted the development of cross-rollup bridges.

Cross-rollup bridges

Cross-rollup bridges rely on and build on top of the native L1<>L2 communication.

By focusing solely on L2s, cross-rollup bridges could offer new solutions that would further lead to an improved user experience.

With this type of bridges, rollups would be able to communicate among themselves, bringing multiple vital benefits:

- **Improved cross-rollup liquidity** that would improve the current fragmentation
- **Easier transactions across rollups** without moving through a mainnet
- **More affordable asset bridging** that would further facilitate onboarding to rollups

However, with significant amounts of assets being bridged across the multichain environment, it's important to consider possible security implications for the user and the ecosystem as a whole. Eliminating points of failure through rigorous development and testing becomes essential for preserving the ecosystem's security.

Cross-chain messaging

Cross-chain messaging protocols further facilitate communication across different chains, enabling the passing of data other than tokens. This type of communication improves interoperability between chains, including rollups, by focusing on the execution of logic rather than the transfer of assets.

With interoperability improvements between rollups, developers have new opportunities for innovation. They can build advanced, composable dapps with a frictionless user experience without the limitations imposed by the inherently fragmented multichain system.

Some projects working on cross-chain messaging improvements include Axelar, with its General Message Passing (GMP), the modular LayerZero framework, with 121.7M messages and more than \$50B transferred in value, Chainlink, with the Cross-Chain Interoperability Protocol, and Nomad, working on an optimistic model. Each of these, and many other cross-chain messaging projects, are different in their approaches to tackling trust assumption issues associated with cross-chain communication.

However, as in the case of bridges, any communication between chains brings a set of risks, emphasizing the importance of security considerations from the earliest stages of protocol development.

→ Chapter 07

Ecosystem trends and initiatives

There are several key trends in the optimistic rollups sector that were initiated last year, and which are already starting to bear fruit. The most impactful were the strategic decisions of Optimism and Arbitrum to launch their rollup frameworks, making optimistic rollups an appealing solution to developers deciding to launch their new projects. Though there are differences in their approach, both offer easy deployment, natively integrated developers tools, and numerous cross-sector partnerships with infrastructure tools.

The second piece of the rollup-scaling puzzle emerged in the form of many new RaaS providers, offering builders an even faster and easier deployment of their own blockchain networks. Their services improve the entire rollup lifecycle from development, deployment, and maintenance to scaling and revenue-generating aspects.

A significant number of DeFi projects that were initially developed and deployed on existing networks decided or announced their own separate, optimistic L2 solutions. What started with Base and Binance launching their on-chain projects seems to continue with more centralized exchanges not wanting to be left out of the game.


Optimistic rollup frameworks

The challenge of scaling the Ethereum ecosystem is tackled on multiple fronts by the leading Web3 teams. Easy, quick, and streamlined deployment of new networks became that much possible with the release of tech stacks by teams such as Arbitrum, Optimism, Polygon, zKSync, and Avalanche. Today, launching a rollup is an order of magnitude more accessible and far more appealing to development teams than launching a project as a dapp on a Layer 2 or Layer 1 network, for that matter.

Builders deploying their own rollups are faced with considerable advantages in deciding to go with this option compared to the previous ways or launching a dapp or a project. As in the case of Arbitrum and Optimism, rollup networks inherit security guarantees from the settlement layer, never having to bother with bootstrapping a new validator set.

Aside from deciding on the tech stack, developers have significant flexibility in deciding on the specifications of their rollup. Yet, the biggest benefit arises from the isolated fee market due to the fact that dapps deployed on their own rollups do not face competition for blockspace as in the case of deployment on a Layer 1 or an existing rollup network.

In their devotion to tackling the challenge of scaling Ethereum, the leading optimistic technology teams, Arbitrum and Optimism, launched technology stacks that enable developers to spin up their own Layer 2 networks or application-specific blockchains with previously integrated infrastructure and developer tooling solutions. Aside from the optimistic teams, other Layer 2 rollup technology providers launched their own tech stacks, like Polygon CDK, Avalanche Subnets and zkSync's ZK-Stack.

	OPTIMISM	 ARBITRUM
Rollup Details		
Primary Chain	OP Mainnet	Arbitrum One
Technology	Optimistic Rollup	Optimistic Rollup
Proof Type	Fraud Proof (in progress)	Fraud Proof
Rollup Maturity Stage	Stage 0	Stage 1
Rollup Tech Stack		
Tech Stack	OP Stack	Nitro Stack
Other Core Contributors	Coinbase, Test in Prod	No other core contributors (yet)
Rollup Framework	Superchain	Arbitrum Orbit
Approach	Horizontal scaling via L2s	L2s / L3s that settle to Arbitrum Mainnet
Notable Projects	Base (general purpose)	Nova (gaming, social)
	Zora (NFTs)	XAI (gaming)
	Celo (general purpose) (planned)	Kinto (KYC, permissioned)

OP Stack

The **OP Stack is an EVM-equivalent rollup development kit**. It is a standardized, shared, open-source software development stack powering the Optimism rollup network. It consists of various software components and tools (modules) that can be used to create new Layer 2 networks. Optimism introduced the stack at the end of 2022 as a “**modular, open-source blueprint for highly scalable, highly interoperable blockchains of all kinds.**”

The **OP Stack consists of several different layers** and modules that fit together to form the development stack for building a Layer 2 blockchain ecosystem envisioned by Optimism. Those layers include the governance, settlement, execution, derivation, sequencing, and data availability layers and showcase the stack as the prime example of the modular thesis. The stack is constantly evolving, and new layers and modules are being proposed and added.

The **key benefit** of the OP Stack is that builders and developers can modify any existing modules, replace them, or create new ones depending on their needs. It allows them to, for example, change the data availability layer from the Ethereum DA to either the Celestia DA, built specifically for the OP Stack, or EigenDA, built by the EigenLayer team.

Thanks to its modular components, the OP Stack is highly scalable, simplifying the creation of new chains. It emphasizes simplicity, scalability, and security so developers can extend and build upon the existing code instead of creating everything from scratch.

Finally, Optimism introduced **Superchain Dev Console**, a set of tools to help and offer frictionless experience to developers that decide to build, launch, and grow their dapps on the Superchain. Tools include a Superchain faucet, Safe multisig support, and fast deployment, alongside various financial incentives and additional partner promo offers.

The **OP Stack lays the foundation for developing the Optimism Superchain ecosystem**, envisioned as a decentralized network of Layer 2 chains (OP chains). Enabling the creation of production-ready optimistic rollups, the stack will also allow for maximum composability and interoperability between the created chains. With integrated message-passing infrastructure, the OP Stack-powered chains will be able to seamlessly communicate yet maintain their sovereignty. Optimism made significant efforts in terms of chain interoperability by standardizing the stack.

The Superchain is a vision of a composable, unified network of blockchains that can support internet-level activity, powered by the MIT-licensed open source OP Stack. Optimism provides two paths for developers:

- Deploy an L2 to accrue sequencer revenue and own the user experience.
- Deploy a dapp on an OP network and join one of the fastest growing EVM ecosystems.

Currently, Superchain is the aggregation of OP Mainnet, Base, Zora, and Mode, with more rollup networks to come. Upcoming Superchain networks include Fraxtal, Lisk, and Redstone.

The projects currently built using the OP stack are Base (TVL: \$2.8B), Blast (TVL: \$2.6B), Manta Pacific (TVL: \$1.6B), Mantle (TVL: \$863M), Mode Network (TVL: \$216M), Aevo (\$90M), Zora (TVL: \$23M), Fraxtal (TVL: \$20M), Lyra (TVL: \$11.7M).

The Optimism ecosystem is clearly growing rapidly, and teams choose the many benefits the OP Stack offers. Numerous upcoming projects have decided to develop their DeFi, NFT, social, privacy, Bitcoin dapp, and RWA optimistic rollups based on the code base. **First Layer 3 projects** are appearing and being developed **on top of Base**.

Arbitrum Orbit

Arbitrum Orbit is a rollup development kit and tech stack created by the Arbitrum Foundation. It is a permissionless solution for developers to build Layer 2 or Layer 3 rollup networks using Arbitrum technology. Orbit-based L2 chains settle on Ethereum, while L3 chains settle on either **Arbitrum Nova** or **Arbitrum One** networks.

Orbit presents **Arbitrum's vision of scaling Ethereum** toward a multichain future and boasts scalability and flexibility in security, execution environments, and governance.

Developers using Orbit for their chain deployment can fully leverage the **Arbitrum Nitro** code and future upgrades. Nitro is a complex upgrade with numerous technical innovations, but the important improvements are rollup configurability, a drop in transaction costs and lower fees, L1 gas compatibility and interoperability, and broader debugging support.

Orbit provides developers with increased computing and storage resource availability, more gas and protocol logic customization, and ease of deployment via low prototyping costs.

The **critical difference for teams deciding on the Orbit** stack lies in the availability of **Arbitrum Stylus**, a next-gen programming environment upgrade that allows builders to deploy programs written in their favourite programming languages, including Rust, C, and C++, to run alongside EVM programs on Arbitrum.

As the name suggests, Orbit is Arbitrum's vision for a universe of interconnected chains. Several NFT and gaming projects are set to launch using this stack.

RaaS providers





After the release of rollup frameworks, several projects started providing Rollup-As-A-Service, with some traditional Web3 infrastructure teams even deciding to commit to the newly identified market need fully. RaaS providers present the **next piece of the ecosystem scaling puzzle**, offering builders an even faster and easier deployment of their own blockchain networks. Some of the first movers include **Conduit, Caldera, AltLayer, and Zeeve**, while the **Gelato** team making significant strides after rebranding as a RaaS provider.

The emergence of the growing sub-sector is an important milestone for the entire ecosystem, as it greatly simplifies the launch of new rollup networks. **RaaS teams provide complete rollup launch services**, from helping builders design, develop, deploy, and maintain new blockchain networks to educating, consulting and keeping up with the changes in the dynamic Web3 ecosystem. This way, RaaS providers remove the need for in-depth blockchain knowledge, especially for the new entrants.

Some of the key services RaaS providers offer to aspiring teams looking to launch a rollup are:

- **Technical support:** node operation, data storage, sequencer hosting, transaction monitoring, and no-code deployment, among others.
- **Scalability support:** cross-integration and partnerships with leading infrastructure providers, offering more cost-effective operations out-of-the-box
- **Education and consultation:** choice of service providers, deployment frameworks, creation of revenue-generating mechanisms and others.

As these new infrastructure pieces fall into place, **new partnerships are being formed among the infrastructure providers and protocols**, leveraging their expertise and the unique services they provide. The role of rollups and RaaS providers is becoming increasingly central for scaling the Ethereum ecosystem. After the Dencun upgrade, we'll see how much these factors contribute to the **summer of scaling**.

Logo	Name	Type of Rollup(s)	Rollup Ecosystems	Launched Chains
	Conduit	Optimistic	OP Stack, Arbitrum Orbit	Zora, Aevo, Mode, Lyra, Syndicate, Hypr, Frame
	AltLayer	Optimistic and ZK	OP Stack, Arbitrum Orbit, Polygon CDK, StarkNet	Various testnet chains
	Caldera	Optimistic	OP Stack, Arbitrum Orbit	Manta Pacific, Kinto, RARI Chain, Loot
	Gelato	Optimistic and ZK	OP Stack, Polygon CDK	Playblock, Re.al, Lisk, Astar zkEVM (Testnet)

Appchains and contenders

The wave of new optimistic rollups launched in great part thanks to the new rollup frameworks and RaaS providers, which, for now, mainly include those based on the OP Stack. Alongside the major ones like Base, opBNB, Blast, Zora, and Mantle, several other rollups are gaining traction in the ecosystem:

- Manta Pacific:** launched in September 2023, the EVM-native zk-focused optimistic rollup on Ethereum has achieved noticeable growth, crossing the \$2B mark, according to data from L2BEAT. It saw considerable outflows after the Dencun upgrade. It markets as the first modular execution layer for the wide adoption of ZK applications. The network is deployed using the OP Stack, leveraging Celestia's DA layer and Ethereum for settlement. It relies on the OP Stack Bedrock codebase to ensure EVM compatibility while allowing developers to build ZK-enabled dapps using Solidity. The team has plans to move to Polygon zkEVM. The leading projects building on the chain are an NFT marketplace and a DEX.
- Mode Network:** Launched at the end of January 2024, Mode is an L2 optimistic rollup based on the OP Stack and powered by Celestia DA, focused on building new economic systems for financial applications. Through its ongoing airdrop campaign, it's looking to attract developers building new decentralized finance applications. It received a significant grant as part of Optimism's RetroPGF program and is deployed using Conduit's RaaS services.
- Aevo:** The latest entrant in the derivatives race is a high-performance decentralized options exchange powered by the OP Stack and Celestia DA. It is a prime example of an appchain where the exchange runs an EVM-based Aevo optimistic rollup on top of Ethereum. It launched last June but made the switch to the Celestia DA at the start of 2024. It is launched and operated with the help of Conduit.

- **Fraxtal:** The team behind one of the most significant decentralized USD-pegged stablecoin assets launched a modular EVM-equivalent Layer 2 rollup based on the OP Stack as its smart contract platform and execution environment. It utilizes its own data availability module, which was developed by the Frax team. Fraxtal is poised to be the home to Layer 3 networks through an innovative incentives system that differentiates it from other rollups.
- **Lyra:** Lyra Chain is an L2 rollup built using the OP Stack specifically for the Lyra protocol - a settlement protocol for spot, perpetual, and options trading. Like several other rollups, the Lyra team utilizes the Celestia DA and settles on Ethereum Mainnet. It's another example of a DEX and derivatives protocol moving to an appchain.
- **BOB:** Short for "Build on Bitcoin", BOB is an upcoming OP Stack rollup project. Frame is designed to support the Bitcoin ecosystem that emerged in the last years. The network presents an innovative idea, bringing Ethereum's innovations and EVM standard to the Bitcoin blockchain as a Layer 2 solution.
- **Frame:** An EVM-compatible L2 optimistic rollup built on top of Ethereum, designed to scale NFT adoption across the Ethereum ecosystem utilizing Arbitrum Nitro technology.
- **Eclipse:** An L2 optimistic rollup powered by the Solana Virtual Machine (SVM), Eclipse utilizes SVM as its execution environment while relying on Celestia for data availability and Ethereum for settlement.
- **Syndicate Frame Chain:** Syndicate, the team behind one of the most used APIs in the Web3 ecosystem, announced they're working on an OP Stack L3 solution built on top of Base, using Celestia's DA.
- **Deri:** Built by the Deri protocol team, this Ethereum L3 solution leverages Arbitrum Nitro to enable efficient cross-chain futures, options, and derivatives.
- **RARI Chain:** RARI is an NFT-specific EVM-equivalent L3 optimistic rollup built on the Arbitrum Nova network. It is built using the Orbit tech stack and Nitro environment and is designed to embed royalties on the node level to guarantee royalty payments to creators.
- **Xai:** Xai is a fascinating new project creating an open-trade ecosystem for video games. It is an L3 solution built on Arbitrum Nova using Orbit's tech stack.

Several teams that have been present in the space for some time have announced they're working on new optimistic rollup networks catered to their specific products and needs. Those include Fuel, Debank, and Lisk.

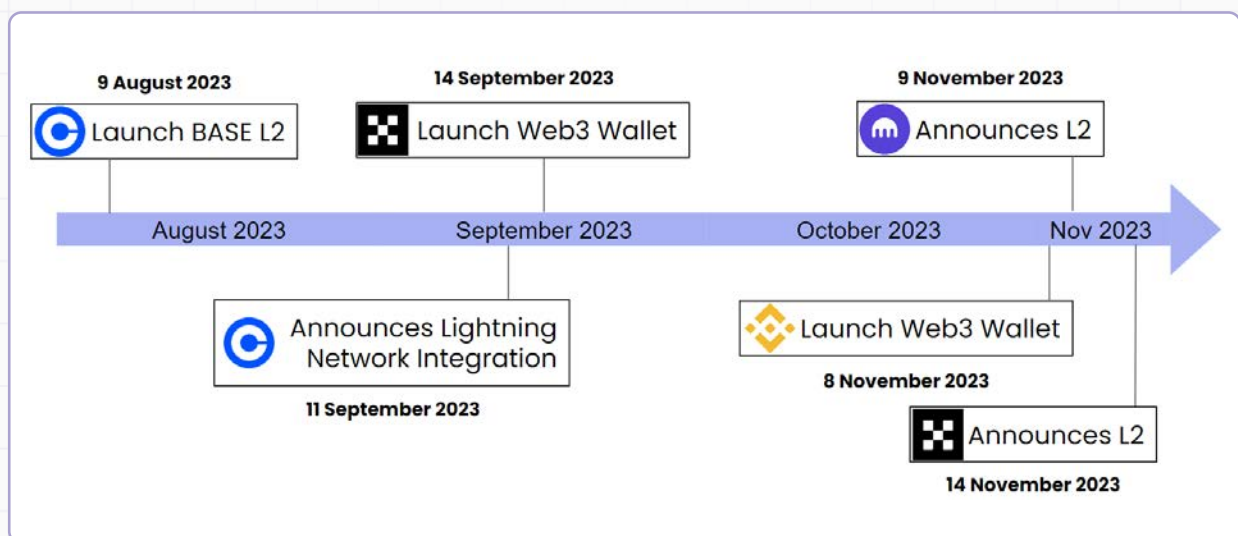
Exchanges launching their own networks

Coinbase and Binance have achieved significant success with the launch of Base and opBNB. Base, in particular, has received a lot of user and project attention and positioned itself as the third most used optimistic rollup. Following the Dencun upgrade, Base is achieving impressive growth at the time of writing this report, with average DAU and number of transactions rising over 300% and 250%, respectively.

Seeing Base's success, several other **centralized exchanges** also announced plans and strategic decisions to launch **their own rollup networks** at the end of 2023. Many centralized exchanges boast a significant user base to whom they want to offer the same experience Coinbase began providing. Additionally, many centralized exchanges have big development teams at their disposal, with vast knowledge and expertise in providing high-quality user experience.

OKX was the first exchange to follow the lead and announce that it would contribute to the Polygon blockchain and launch its own L2 network using Polygon CDK. The project is known as X1, and the plans outline that it will be a zkEVM-based solution for the time being.

While there was no formal confirmation or announcement, Coindesk reported at the end of 2023 that **Kraken**, one of the biggest US-based exchanges, is exploring partnerships with numerous teams in launching their own Layer 2 rollup network.



Source: Outlier Ventures, "Exchanges' Move To Open Source"

<https://outlierventures.io/article/exchanges-move-to-open-source/>

Wallets launching their own L2s

Zerion, one of the most used Web3 wallet providers, formally announced in mid-March 2024 that it is already building an Ethereum-based Layer 2 rollup network called **ZERO network** with the primary objective to **offer zero fees**. Zerion plans to launch the new network in late Q2 or Q3 of this year with its unique selling proposition of being **entirely free to use**.

The team came up with the idea for the free rollup network after the Dencun upgrade when the initial fees for blobs dropped to zero. Subsidizing the use of the network makes sense from Zerion's angle as it is betting heavily on the network effect, and many users deciding to continue using Zerion's already famous and UX-friendly wallet. With the L2 fees sharply dropping after the Dencun upgrade, user acquisition for the Zerion wallet is comparatively higher.

The launch and success of an L2 rollup by a big wallet provider such as Zerion will determine such potential decisions for other teams developing non-custodial wallets, depending on the business model's viability.

Final thoughts: Cautious optimism

There are reasons to be optimistic about Ethereum ecosystem scaling and the multichain future. There's a significant YoY increase in on-chain activity, usage, and number of users across optimistic rollups. After the immense success of the first movers over the first two years, an increasing number of new optimistic rollups are being launched weekly for general and specific purposes.

The Ethereum community's rollup-centric roadmap seems the right path for tackling the blockchain trilemma for the time being. Q1 of 2024 and the changes introduced by the Dencun upgrade are another testament to the Ethereum developers' continued support for the broader ecosystem and multichain future. This path continues to bear fruit by offering a user-friendly, affordable, and improved experience for onboarding new users to the Web3 ecosystem. Optimistic rollups, so far, seem to benefit the most from the upgrade, witnessing the highest drop in transaction costs while steadily increasing the number of transactions per second, the number of users, and the total value locked.

The availability of tools is improving, with more and more key developer tools supporting new chains. The new rollup tech stacks, frameworks, and numerous cross-network and company partnerships are fueling the next generation of optimistic rollups, which are now launched with more ease, more streamlined tolling support, and better user experience.

Challenges

Though there are many reasons to be optimistic for the rollup-centric, modular and multichain future, certain challenges remain.

- **State validation:** For now, many optimistic rollups have their fraud proof systems still in development, which means that users need to trust the block proposer to submit correct state roots, as invalid ones can be submitted. If an invalid state root is submitted to the system, user funds can be stolen.
- **Exit window:** The second important user aspect is that many Layer 2 solutions do not have a time window for users to exit in the case of an unwanted upgrade since contracts are instantly upgradable.
- **Finality:** Compared to the zk rollups, which have no execution delay between state root submission and finalization, optimistic rollups are faced with a 7-day delay period, corresponding to the challenge period before achieving finality, at which point transactions cannot be reverted or reordered.

Leading networks are working on upgrades that will resolve these challenges and both Arbitrum and Optimism are devoted to implementing changes in their bids toward progressive decentralization.

Staying optimistic

Taking into the account all the developments, important milestones, technical upgrades, and rising user adoption, it's safe to say that optimistic rollups are retaining their leading rollup positions and helping scale the Ethereum ecosystem.

Following all metrics reaching new all-time highs, while the cost of transacting keeps decreasing, the Dencun upgrade has delivered, and the Ethereum community's commitment to the rollup-centric roadmap is undeterred. These solutions are the essential piece of the multichain future toward which the ecosystem is evolving. It's very exciting to see an increasing number of new networks being launched, and we cannot wait to see what the Layer 2 rollup summer brings.



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