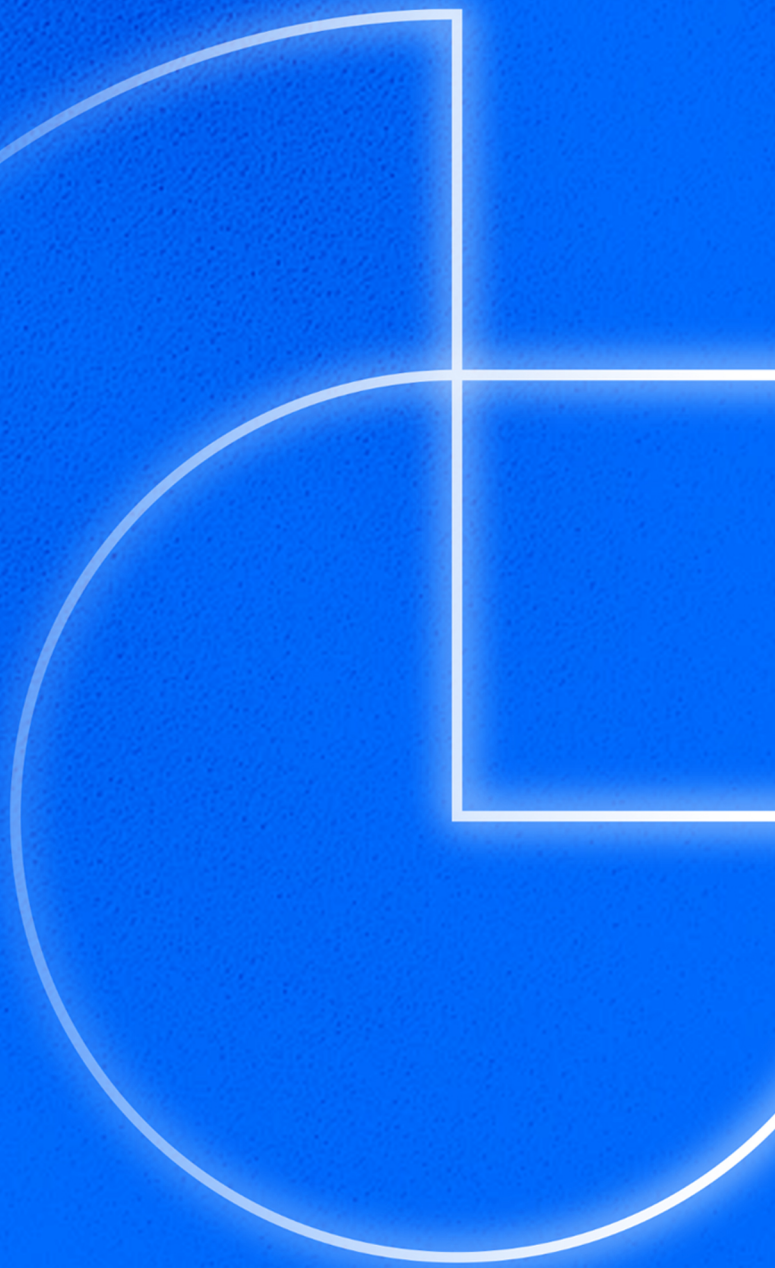
Visualizing the TON Ecosystem:

User Growth, App Landscape, & Future Trends



Gate Research

Key Takeaways

- **Telegram User Base**: In 2024, Telegram's monthly active users (MAU) reached 950 million, a 40-fold increase since 2013. In 2023, the TON (The Open Network) network had 2.5 million users. Despite the relatively low penetration rate of TON users among Telegram's 950 million users.
- **TON Applications**: In Q2 2024, the number of new TON applications doubled compared to the preceding months, with gaming applications contributing to 30% of this growth. Gaming apps saw explosive growth during this period, with mini-games on TON, such as Hamster, attracting over 55 million users.
- **TON Ecosystem Tokens**: The number of ecosystem tokens experienced rapid growth in 2024, surpassing 30,000 tokens. A notable example is the token Notcoin, which has entered the top 100 in terms of market capitalization. The total market cap of TON ecosystem tokens has now surpassed $1 billion and continues to grow.
- **TON DeFi Ecosystem**: In July 2024, the Total Value Locked (TVL) within the TON ecosystem reached an all-time high of $770 million. However, due to the decline in Toncoin's price and broader macroeconomic factors, it fell back to $400 million. The daily trading volume across TON's decentralized exchanges (DEXs), including STON.fi and DeDust, remains under$5 million. Most of the DeFi TVL is attributed to Toncoin's liquid staking.
- **User Activity and On-Chain Transactions**: Active daily addresses on the TON blockchain represent about 12% - 13% of the total, while on-chain transaction volume accounts for 5% - 6%. This indicates that despite relatively high user activity, the frequency of on-chain transactions remains low.
- **Developers and Ecosystem Development**: As of 2024, the TON ecosystem hosts approximately 250 active developers, a figure that is relatively low compared to more established ecosystems like Ethereum. However, mini-apps and gaming applications within the TON ecosystem have emerged as the primary drivers of user growth. Social viral marketing on Telegram also provides a significant advantage for community expansion.

Keywords：

Gate Research, TON

Visualizing the TON Ecosystem: User Growth, App Landscape, and Future Trends

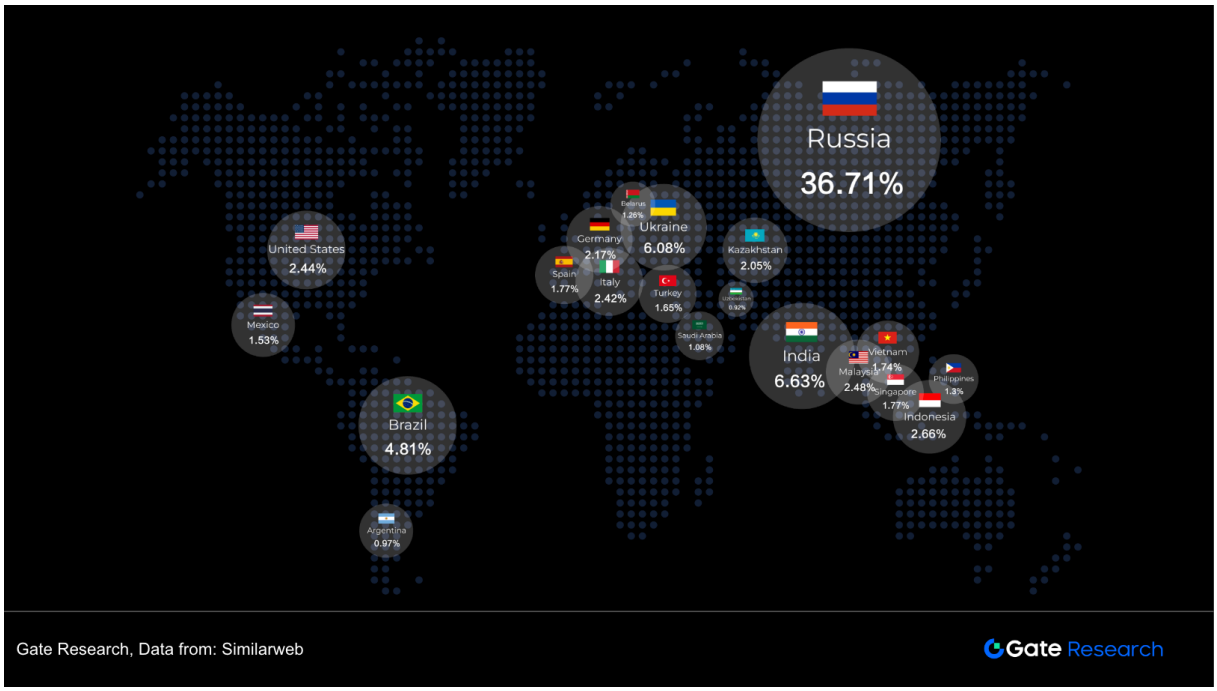
1 Introduction

TON (The Open Network) is a decentralized blockchain platform initially designed and developed by Telegram's Web2 communication software team. Due to compliance issues, the community gradually took over the development and growth of TON. Its close partnership with Telegram has provided TON's ecosystem with a natural pool of users. Simple and easy-to-play "click-to-earn" games like Hamster and Notcoin have attracted over a million new Telegram users to the Web3 world. This substantial user potential has drawn numerous Web3 developers and investors into the TON ecosystem. This article will provide a systematic overview of the TON ecosystem, beginning with its origins in Telegram, and will examine the growth trajectory of TON as well as the potential opportunities highlighted by the data.

2 The Origins of TON and Telegram

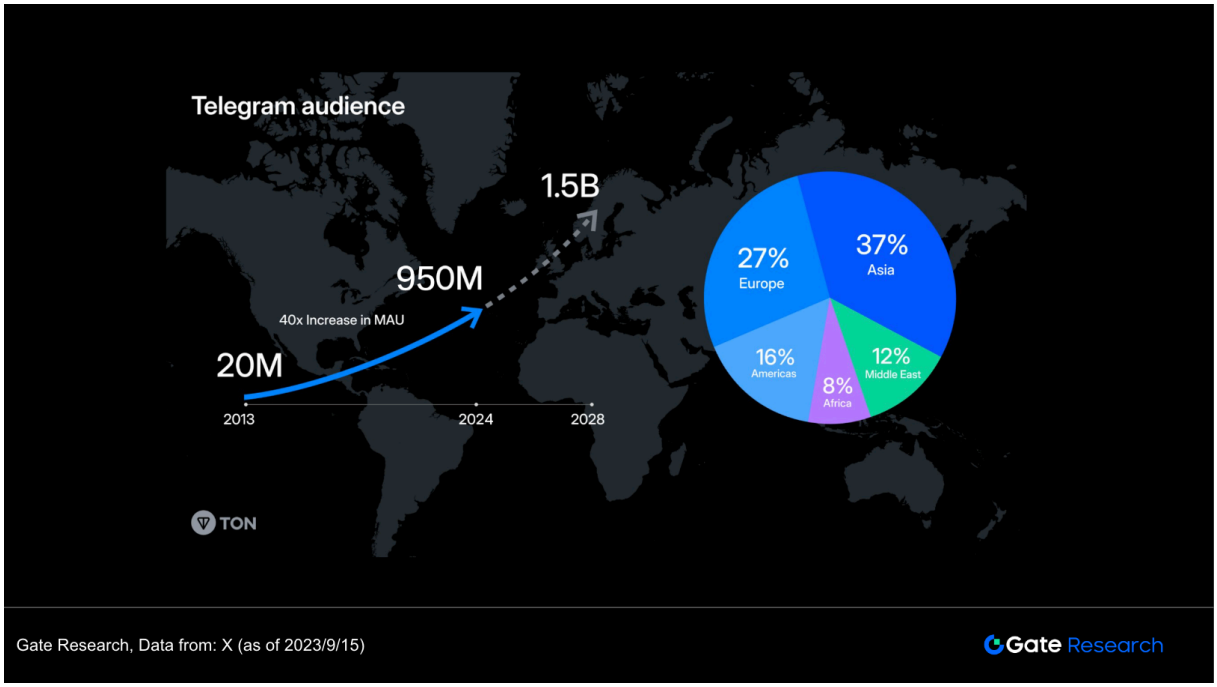
Telegram is a cross-platform instant messaging software developed in 2013. The founders, Nikolai Durov and Pavel Durov were also the creators of Russia's largest social networking service, VKontakte. Due to the founding team's background, Telegram has a large user base in Russia, with approximately 36.71% of Telegram users coming from the country. Besides Russia, Telegram has a significant user base in countries like Ukraine, India, and Brazil.

Figure 1: Distribution of Telegram Users



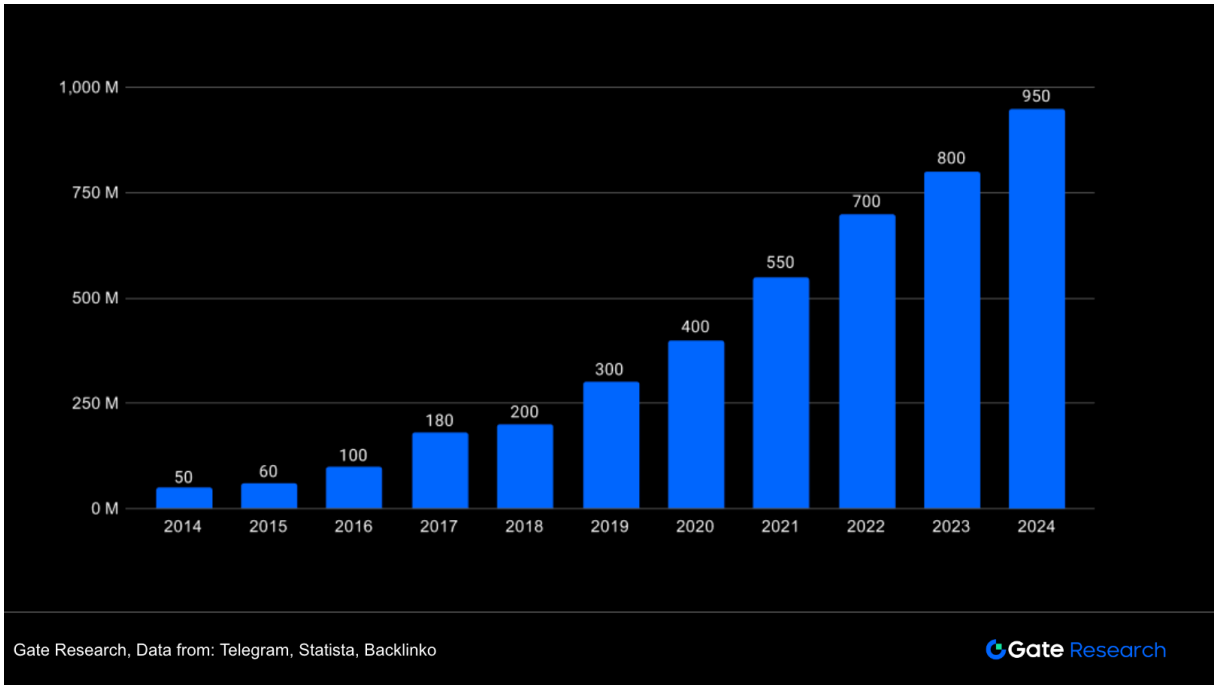
Over the past 10 years, Telegram has achieved a 40-fold increase in monthly active users (MAU). According to predictions by the TON Foundation, Telegram is expected to reach 1.5 billion users by 2028. Based on the user distribution shown in the figure, Telegram has made significant progress in emerging markets across Asia, the Middle East, and Africa. For instance, in Southeast Asian countries and regions like India and Vietnam, as the internet and globalization continue to advance locally, Telegram is expected to acquire users in these emerging markets rapidly. Many of these regions are also crypto-friendly, such as Southeast Asia, which played a major role during the boom of blockchain games.

Figure 2: Telegram User Growth Curve and Regional Distribution



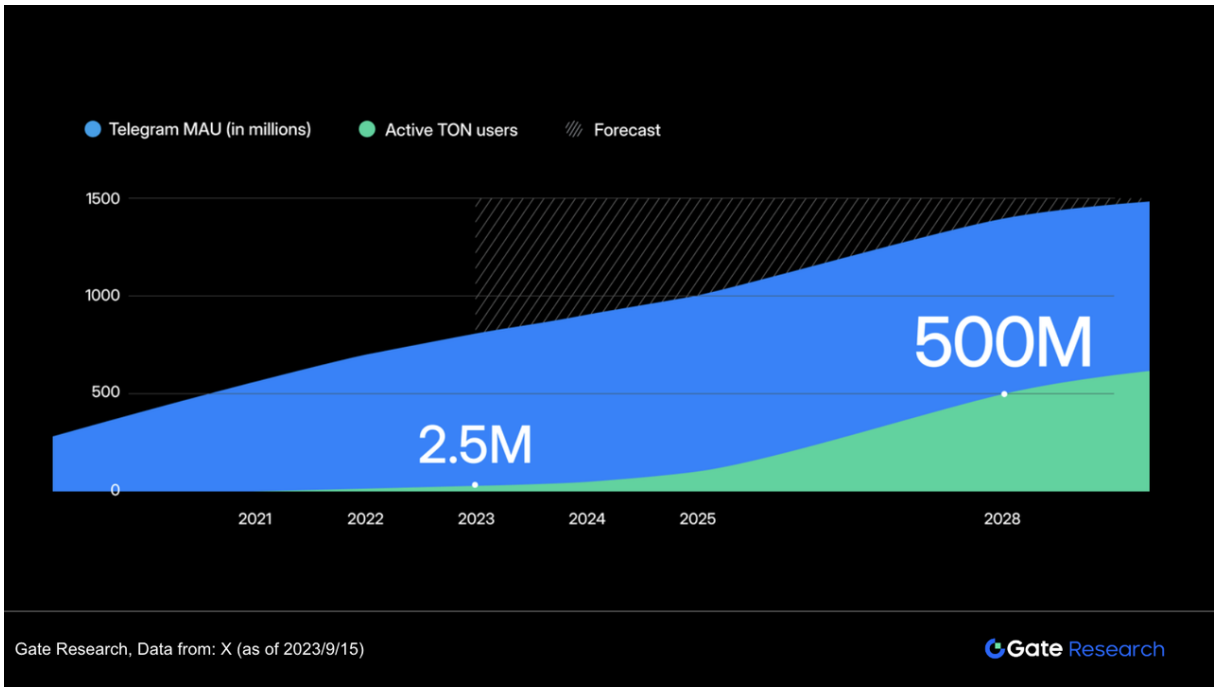
In 2018, the Telegram team began exploring blockchain solutions suitable for Telegram Messenger when its MAU surpassed 180 million. However, the development of the blockchain network was interrupted when Telegram faced a lawsuit from the SEC over the issuance of TON tokens. In 2020, an open-source development team called NewTON (the predecessor of today's TON Foundation) continued the network's development, following the original design concept, and announced the mainnet launch in May 2021. In September 2023, the TON Foundation and Telegram officially announced their partnership at the Token2049 conference. Over the seven years of TON's challenging development, Telegram's MAU increased by 527.8%, reaching 950 million in 2024.

Figure 3: Changes in Telegram Monthly Active Users from 2014 to 2024



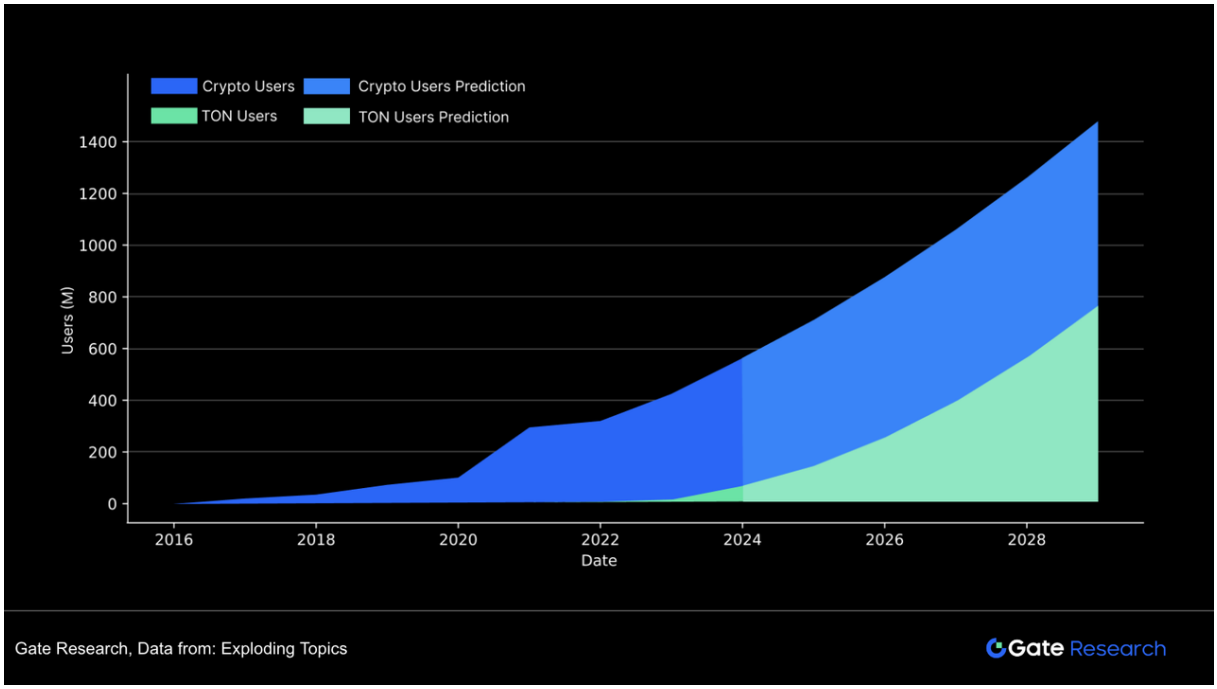
Although the TON network reached 2.5 million users in 2023, its penetration remains very low compared to Telegram's vast user base. The TON Foundation has outlined its goal on social media: by 2028, it aims to transition 30% of Telegram's active users into the Web3 ecosystem, targeting 500 million active users within the TON ecosystem [1].

Figure 4: TON User Base and Growth Target Curve of the TON Foundation



Currently, the total number of crypto users is approximately 500 million, with TON occupying only a small fraction of this market. However, based on the aforementioned TON user targets and data projections, TON is expected to become one of the main sources of new users in the Web3 space. This significant potential for user growth presents tremendous opportunities for developers and ecosystem builders.

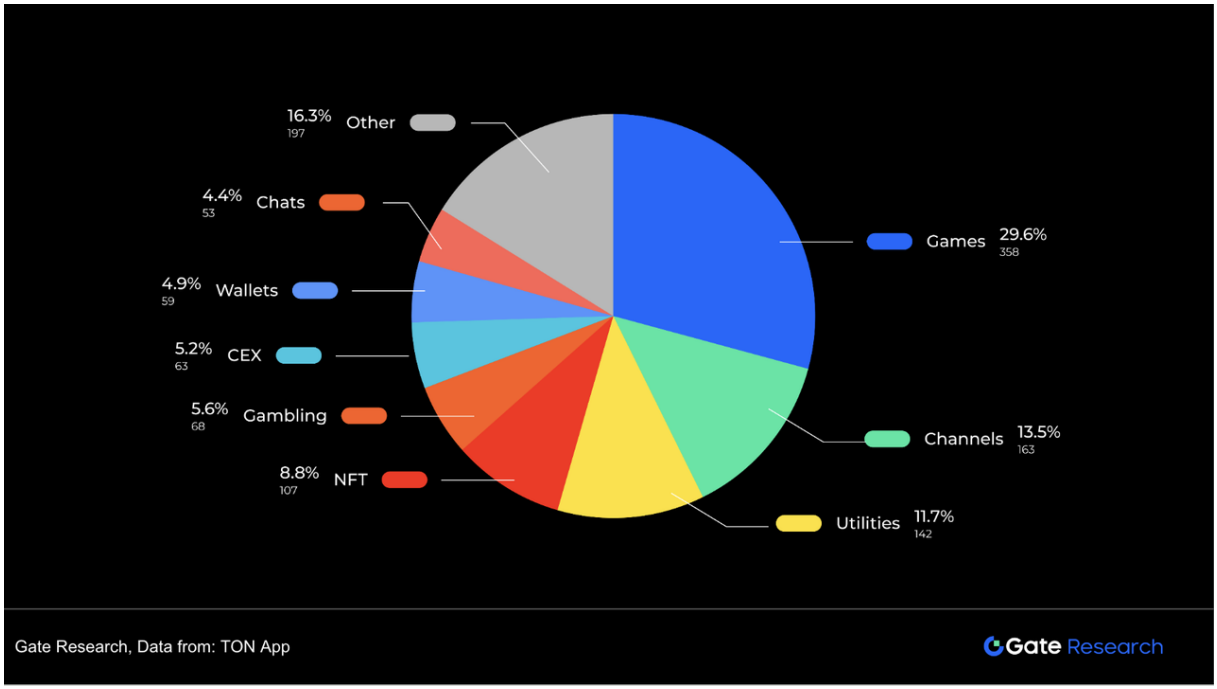
Figure 5: Growth Curve of Potential TON Users and Overall Crypto User Numbers



3 TON Applications

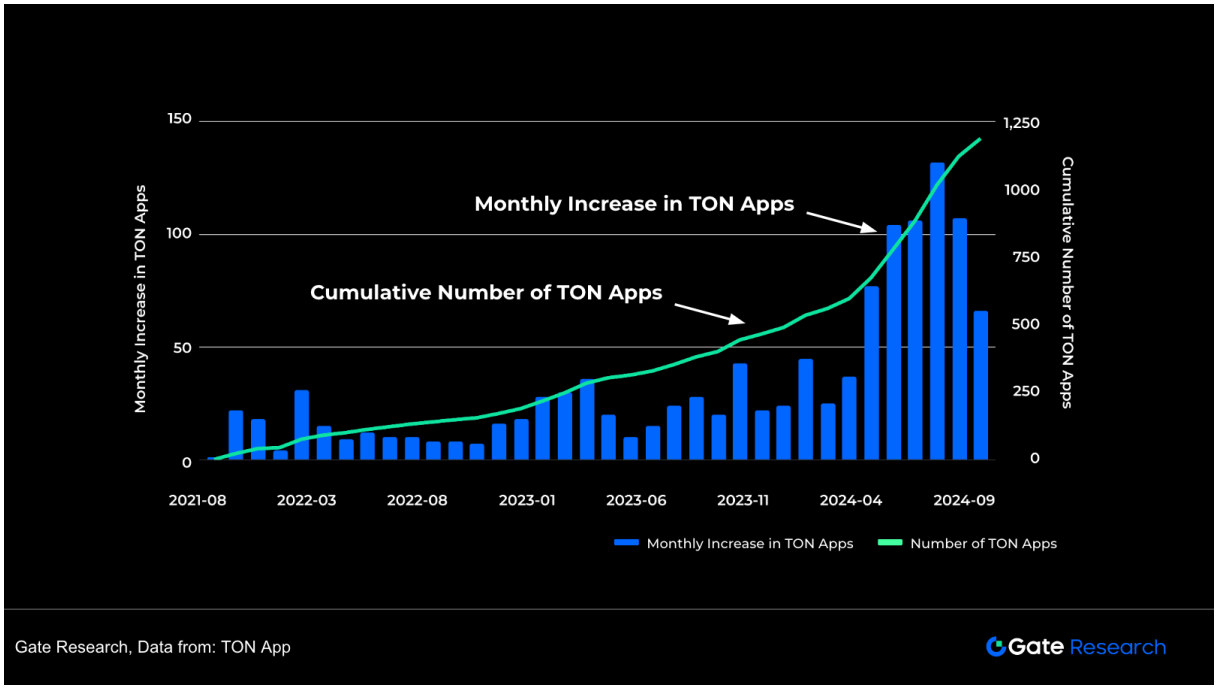
Since the launch of the TON mainnet in May 2021, fundamental applications like cross-chain bridges, payment tools, and DeFi infrastructure have continually improved. The foundation has consistently introduced support and incentive programs for developers. Today, application development within the Telegram ecosystem is relatively comprehensive, covering various applications and protocols such as wallets, trading, NFTs, and games. Among these, game-related applications account for about 30%, making them a significant feature of the TON ecosystem.

Figure 6: Proportion of TON Application Categories



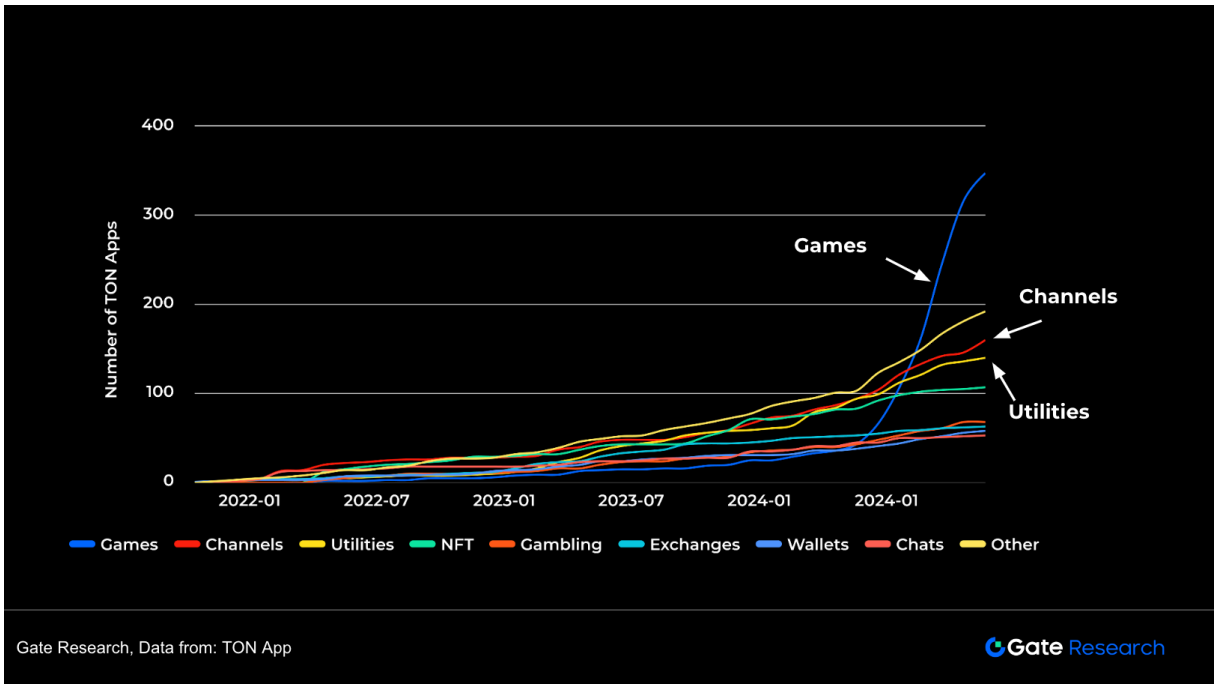
Developers within the TON ecosystem have continuously built various fundamental applications. In Q2 of 2024, the number of TON applications experienced rapid growth, with the monthly number of new applications doubling or exceeding previous figures. Many well-known applications were developed quickly during this period, including the metaverse game Catizen and hyper-casual games like Yescoin.

Figure 7: Bar Chart of Monthly New TON Applications and Cumulative Growth Curve



The chart below shows that the number of new game-related applications is the highest, with the fastest growth rate. Telegram supports ”Mini-apps” similar to WeChat’s mini-programs, allowing many casual mini-games to be directly embedded within Telegram, making them easily accessible and discoverable by users. For example, ”Tap-to-Earn” games, like Hamster, let users tap the screen (such as hitting hamsters) to earn in-game points or currency, which can then be exchanged for a corresponding amount of HMSTR tokens. Leveraging Telegram’s social platform, the ”invite-and-reward” model of social viral growth becomes particularly feasible. Many applications quickly surpass a million subscribers and reach millions of active players thanks to Telegram’s large user base and effective viral marketing strategies. A detailed introduction follows below.

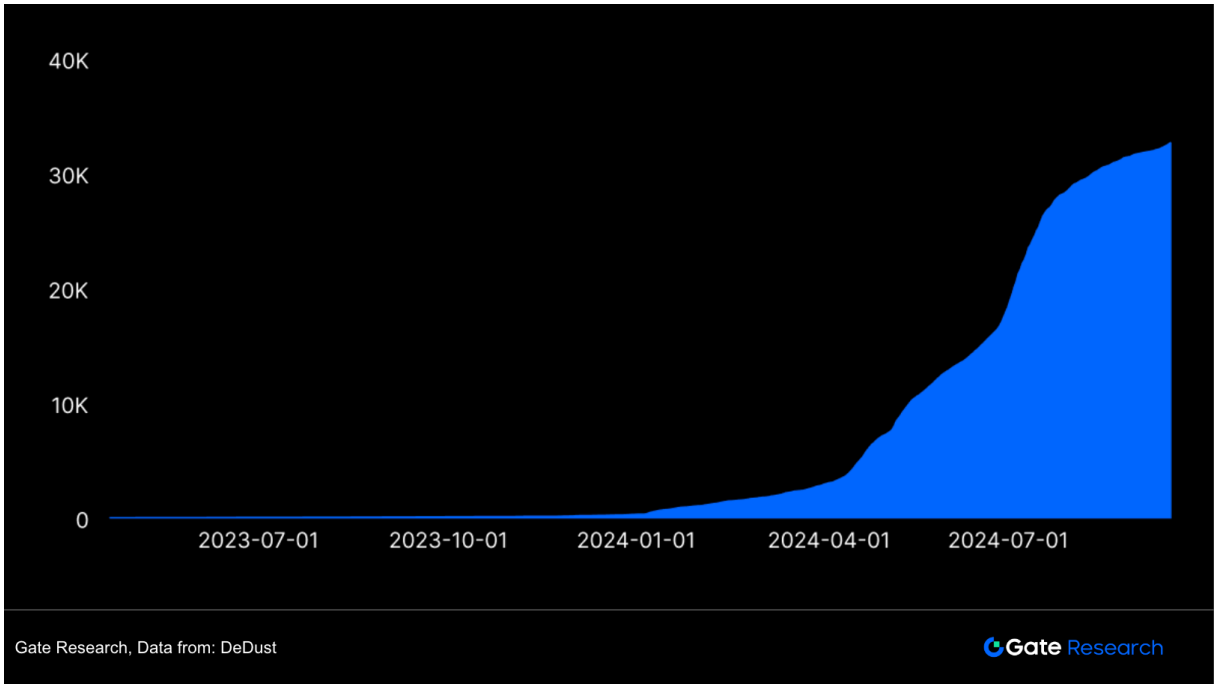
Figure 8: Growth Curve of Different Categories of TON Applications



4 TON Ecosystem Projects/Tokens

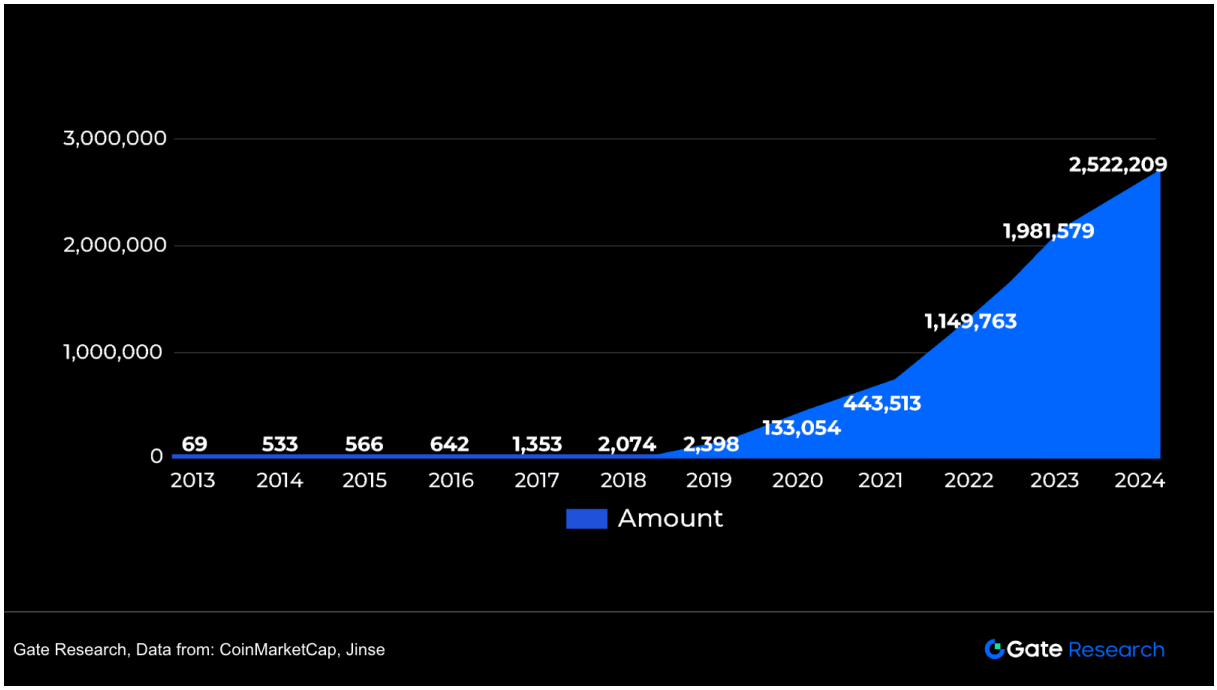
After entering 2024, the number of tokens within the TON ecosystem has grown rapidly, with over 30,000 tokens now listed on the native DEX. These newly issued tokens include not only utility tokens from native TON projects but also tokens like REDO (Resistance Dog), BUFFY (Buffy) as meme tokens, and derivative tokens like tsTON (Tonstakers TON).

Figure 9: Change Curve of Newly Issued Tokens in TON



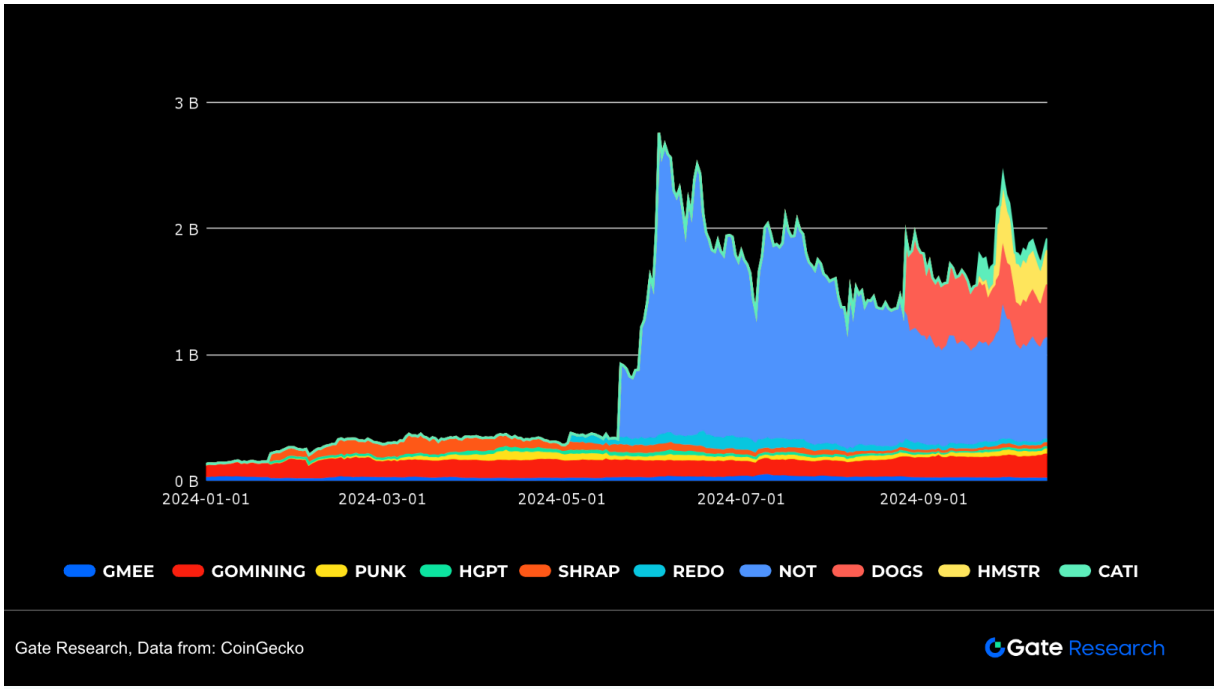
However, compared to other public chains, the number of tokens on TON is still relatively small. For example, the popular Solana ecosystem has already seen over 2.5 million tokens issued on its chain in 2024. Considering the application growth curve mentioned earlier, most new applications within the TON ecosystem are still in the development phase and have not yet undergone TGE (Token Generation Event). This means there are still plenty of opportunities for new tokens to be launched within the TON ecosystem.

Figure 10: Annual Change Curve of New Token Issuances in the Solana Ecosystem (Including Pump.Fun)



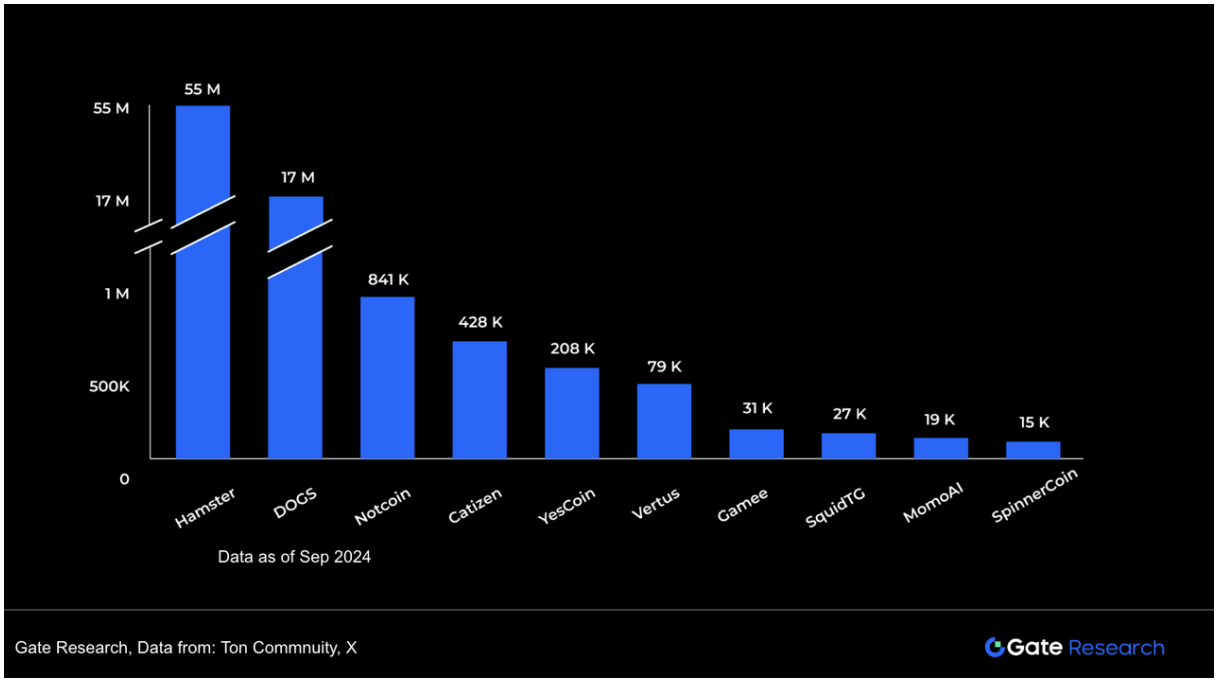
Among the new tokens, the listing of Notcoin is particularly noteworthy. As the first token within the TON ecosystem, besides TON itself, to be listed on major exchanges, Notcoin has generated significant wealth, with its market cap soaring into the top 100 on CoinGecko. Following this, popular TON tokens like Dogs and HMSTR could enter pre-market trading on leading exchanges such as Gate.io, Bybit, and Bitget even before their TGE, and received strong support from these exchanges during their official TGE. The market cap of tokens in the TON ecosystem has now surpassed $1,000 million and continues to grow.

Figure 11: Change Curve of TON Token Market Capitalization



The successful launch of popular projects in the TON ecosystem is closely tied to its large user base. According to Etherscan statistics, Ethereum's most active Web3 ecosystem had about 50 million daily active users in October, while the TON ecosystem's mini-game "Hamster" boasted over 55 million users. A large portion of these Mini-app users comes from non-Web3 users on Telegram, further demonstrating the significant growth advantage brought by the collaboration between the TON ecosystem and Telegram.

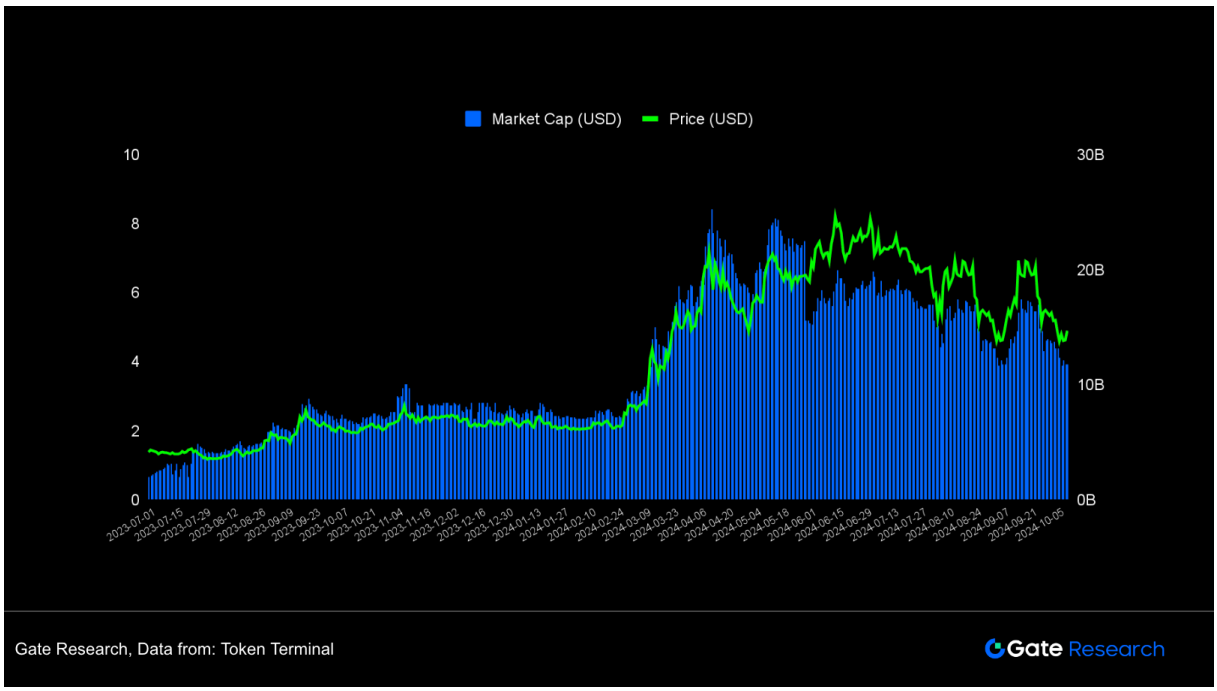
Figure 12: User Numbers of Popular TON Applications



5 TON Data Analysis: DeFi, Chain, Developers

The price of Toncoin began to rise steadily from Q1 2024, preceding the rapid growth of applications (in Q2) and the market capitalization of tokens (in Q3). With the emergence of viral applications and projects, the TON ecosystem is expected to become even more dynamic, potentially further driving up the price of TON.

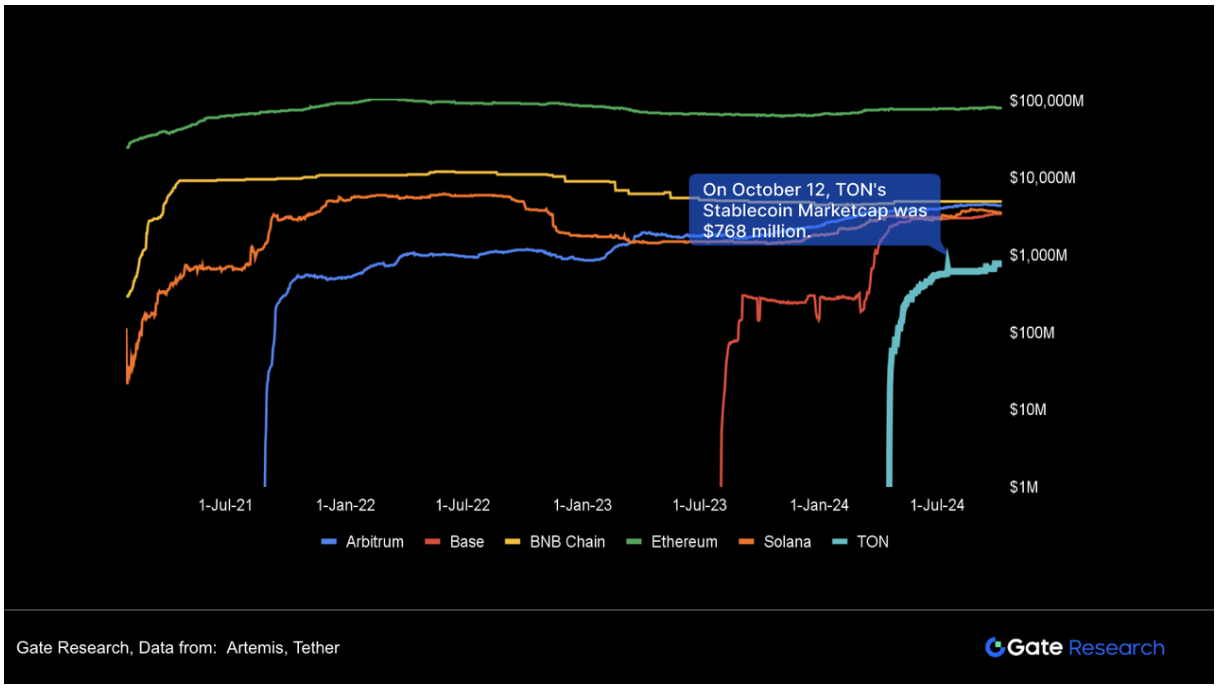
Figure 13: Toncoin Price and Market Cap Change



On April 19, 2024, Tether announced the deployment of its stablecoin USDT on the TON blockchain and in the Telegram wallet. Following this announcement, the scale of stablecoins within the TON ecosystem experienced rapid growth, surpassing $700 million by September. This growth indicates increased on-chain liquidity and activity on TON during Q2 and Q3. However, compared to established leading public chains like Ethereum and BNB Chain, the scale of stablecoins on TON remains smaller, partly due to the current slow development of DeFi on the chain (this will be discussed further below).

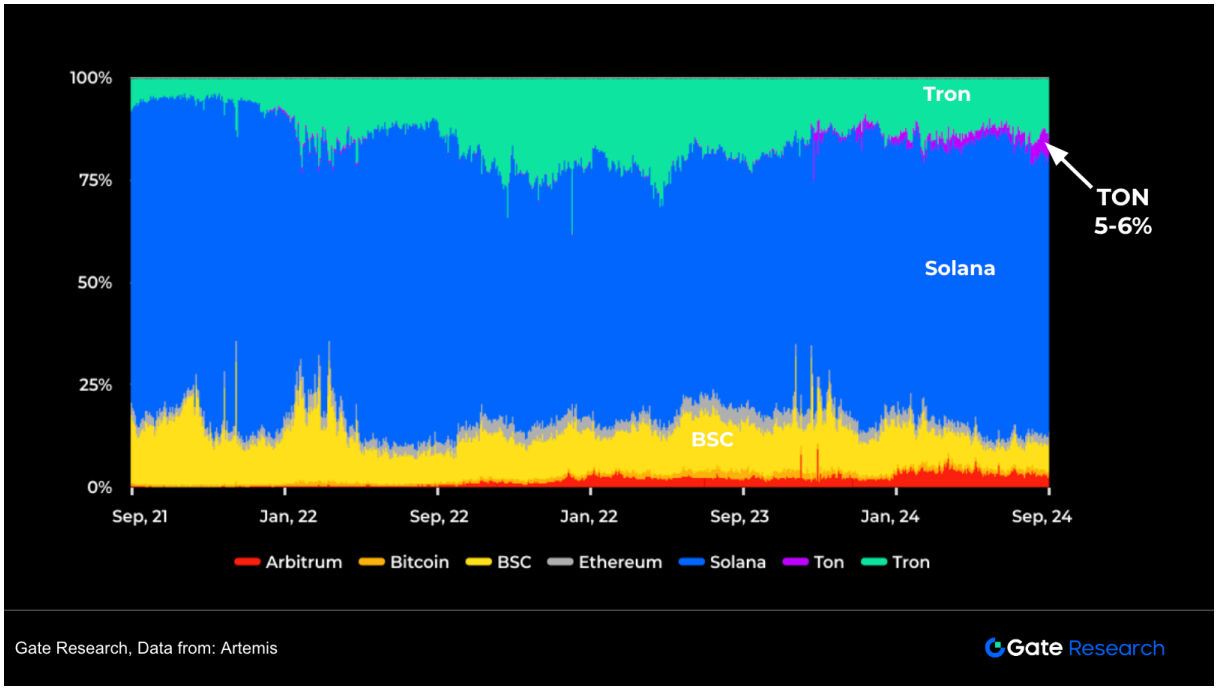
TON has already introduced the ”TON Payments” feature and is working on a stablecoin toolkit. With its large user base in emerging countries with underdeveloped financial infrastructure, Telegram integrates stablecoin payments through the TON Payments feature. Its built-in wallet bot is poised to reach more users in these emerging markets [2].

Figure 14: Market Cap Changes of Stablecoins on TON and Other Popular Blockchains



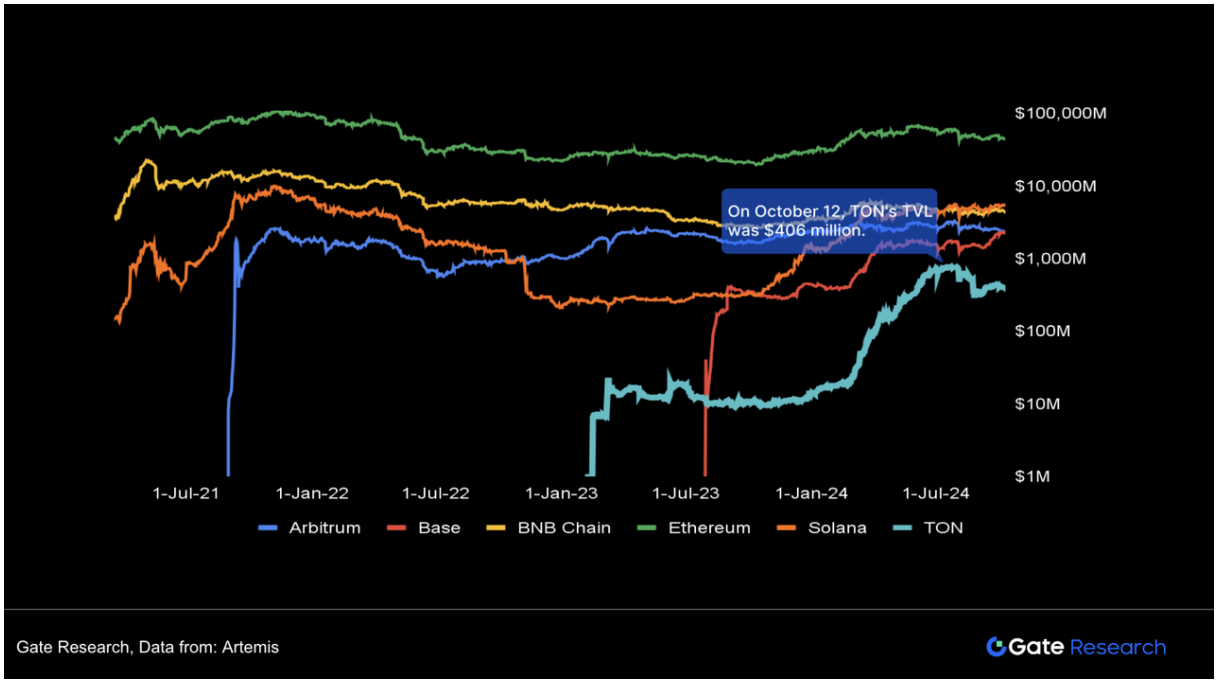
If we sum up the transaction volumes of active blockchains, TON currently only accounts for about 5%-6%. Blockchains like Solana, which focus on new narratives such as memes, gaming, and DePIN (short for Decentralized Physical Infrastructure Networks), have many on-chain transactions. In October, the TON community launched the ”Memelandia” initiative to create a thriving ecosystem for meme coins. This initiative is supported by both the TON Foundation and the TON Society. Meme launch platforms like Pump.fun have also been established on TON. Leveraging Telegram as a social platform, TON memes have a natural advantage in community-based dissemination. However, the ultimate impact of the meme narrative on TON’s development remains to be seen.

Figure 15: Proportion of On-Chain Transactions of TON Compared to Other Popular Blockchains



DeFi remains one of the weak points of the TON ecosystem. When comparing the Total Value Locked (TVL) across popular blockchains, TON's TVL is still relatively low. In the early stages of TON's development, after the TVL surpassed $10 million, it entered a period of stagnation. It wasn't until Q1, when the price of Toncoin started to rise, that the TVL began to grow steadily. However, the most rapid growth occurred in Q2, during the period of stablecoin issuance and the surge in applications.

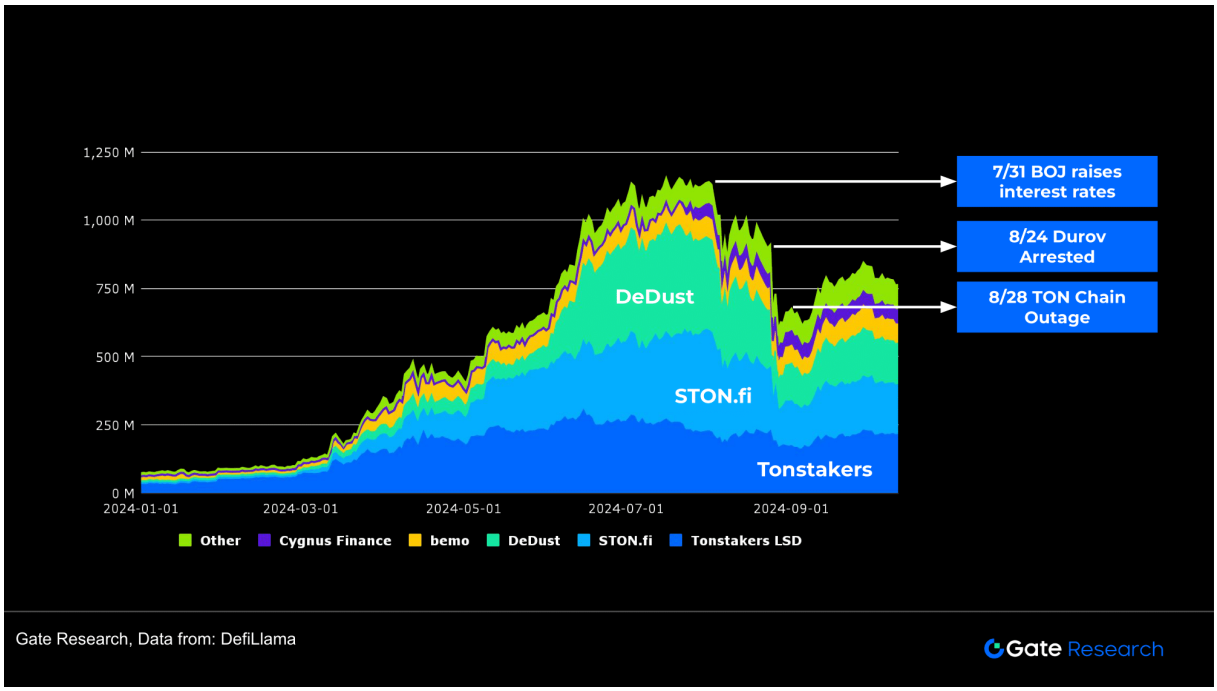
Figure 16: TVL Change Curve of TON Compared to Other Popular Blockchains



July marked the historical peak of TON's DeFi Total Value Locked (TVL), surpassing $770 million. However, this was followed by a decline in TVL to around $400 million, influenced by several factors, including a drop in Toncoin's price due to macroeconomic conditions and the arrest of Telegram's founder. Despite these setbacks, the TVL of decentralized exchanges (DEXs) in the TON ecosystem, such as STON.fi and DeDust, continued to rise.

After the arrest of the Telegram founder on August 24, liquidity-staking products like Tonstakers experienced a smaller decline in TVL compared to DEXs. This resilience could be attributed to users' returns from liquidity-staking products being less sensitive to short-term drops in trading volume. The longer lock-up periods and stable return expectations also make users more inclined to retain their assets. Moreover, it is noticeable that DeFi products beyond DEXs (classified as "Other") have been locking in more capital, indicating an increasing diversity of DeFi offerings in the TON ecosystem.

Figure 17: TVL Distribution and Changes of TON Protocols

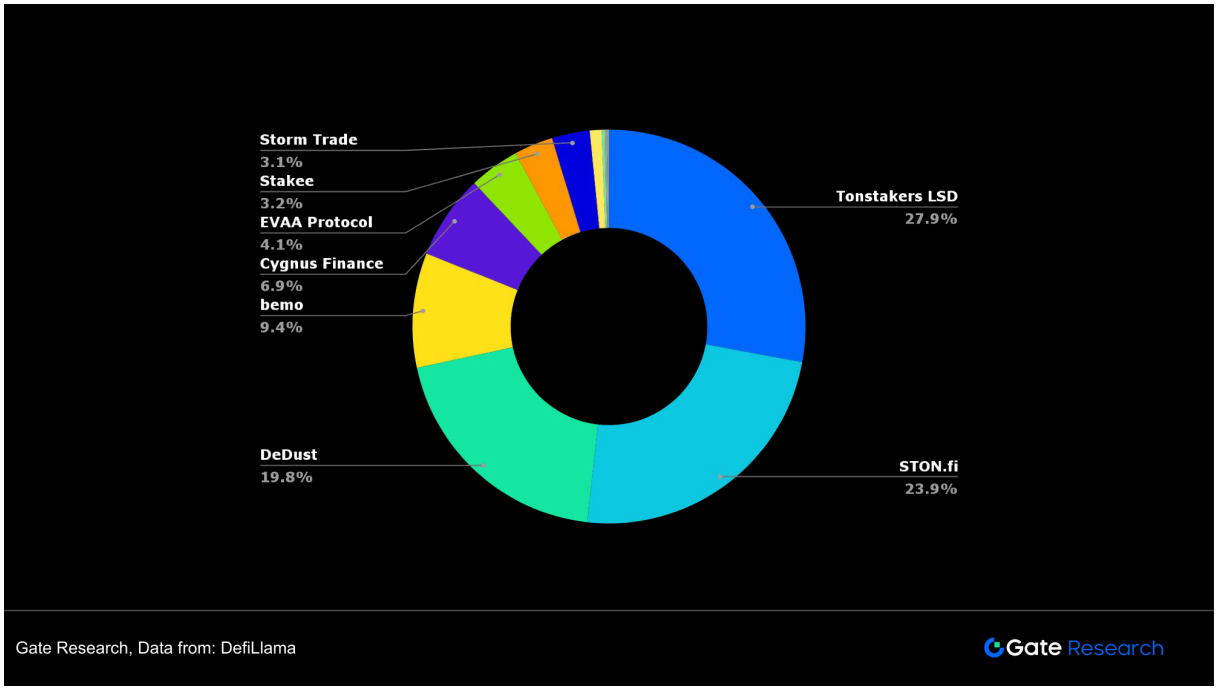


The comparison of the figures highlights the significant role of DeDust and STON.fi as the two main decentralized exchanges (DEXs) within the TON DeFi ecosystem. Currently, the TON ecosystem lacks large, multi-chain DEXs like Uniswap or PancakeSwap, so the competition among DEXs is primarily between DeDust and STON.fi.

As a blockchain using Proof of Stake (POS) consensus, over one-third of TON's current TVL comes from the staking and locking of Toncoin. Liquidity staking products such as Tonstakers, Bemo, and Stakee hold a substantial share of this TVL. This concentration is partly due to the price increase of staked Toncoin, which has driven up the value of staked assets. Additionally,

the limited number of tokens within the TON ecosystem contributes to this dynamic, as a large portion of the trading volume for newly issued tokens like NOT and HMSTR occurs on centralized exchanges (CEXs) rather than on-chain.

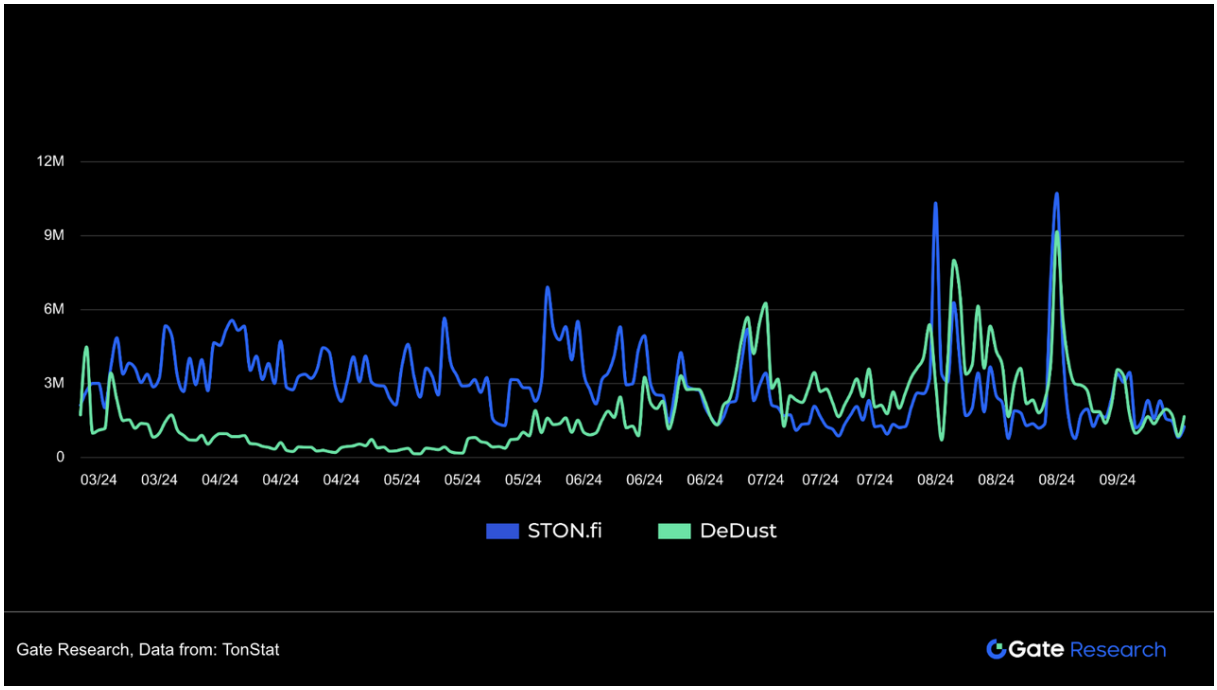
Figure 18: Distribution of TVL in the TON Ecosystem



Taking the two largest DEXs in the TON ecosystem as examples, DeDust has recently increased trading volume, gradually reaching levels comparable to STON.fi. However, the daily trading volume for both DEXs typically remains below $5 million. For instance, on October 10th at 15:00, the trading volume for the popular token HMSTR reached $82.77 million on centralized exchanges (CEXs), while the HMSTR-TON trading pair on DeDust only saw a trading volume of $18.786K.

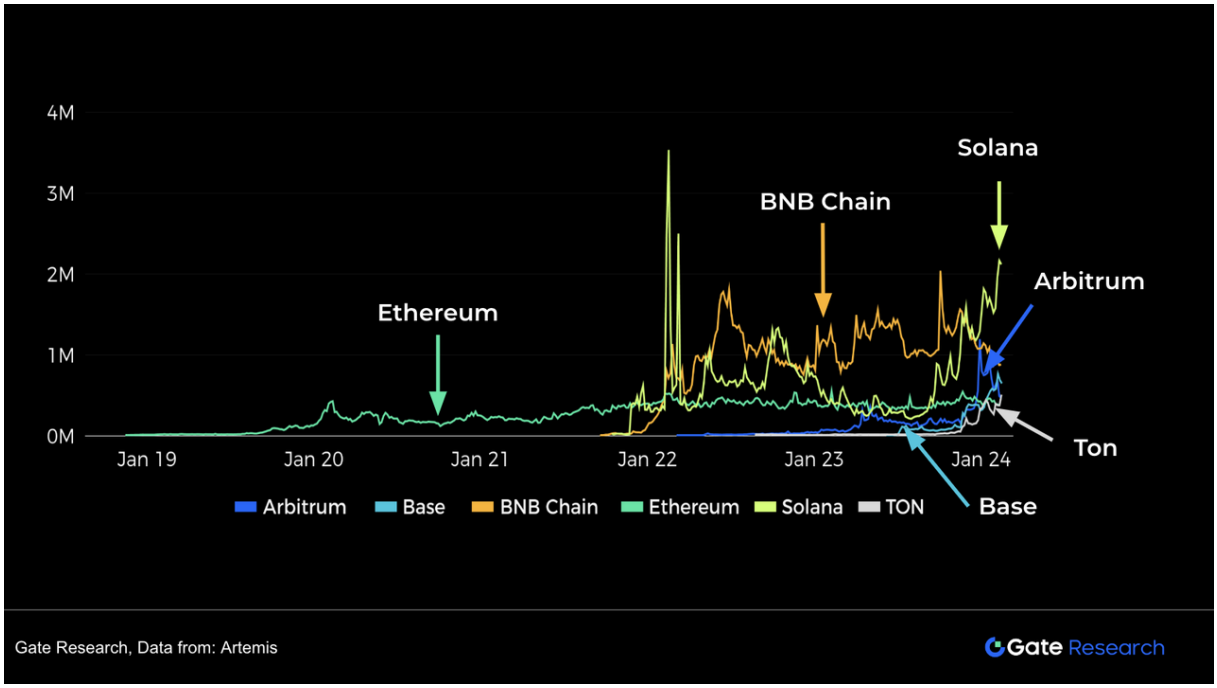
Beyond DEXs, other segments like lending applications, derivatives protocols, and re-staking, which are more mature on other blockchains, have very low TVL and trading volume in the TON ecosystem. This highlights a challenge for TON's DeFi projects: how to effectively convert Telegram's large base of active users into users of their decentralized applications (DApps).

Figure 19: Trading Volume Change Curve of STON.fi and DeDust



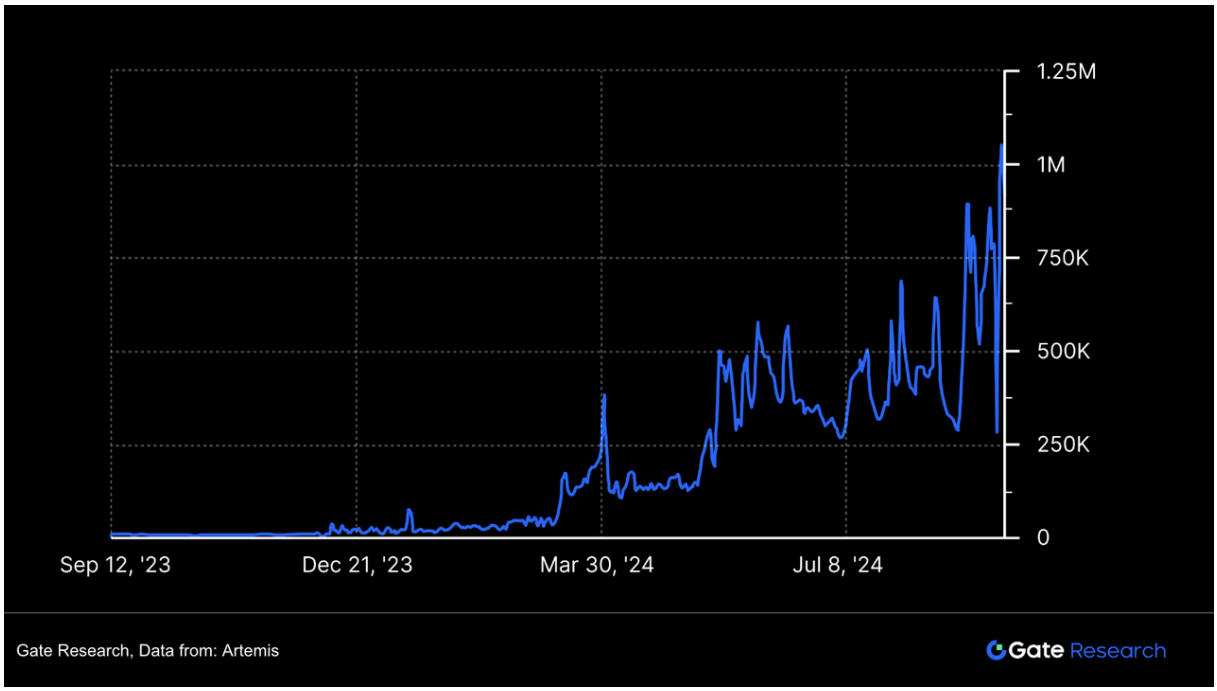
The number of active addresses on a public blockchain is often positively correlated with DeFi transaction volumes and the number of DeFi participants. In less than a year, the daily active address count in the TON ecosystem has surpassed popular public blockchains such as Ethereum and Arbitrum, and at certain times, even exceeded that of BNB Chain and the recently popular Layer 2 solution, Base.

Figure 20: Comparison of Active Addresses Across Major Popular Blockchains



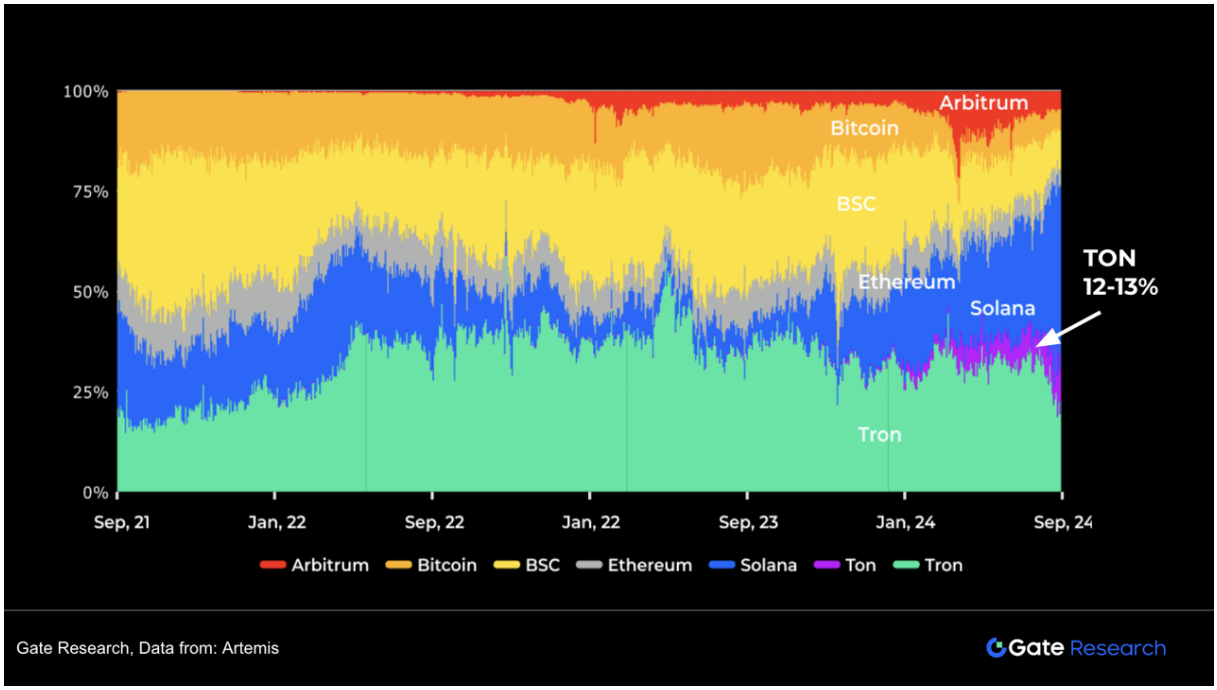
The trend of active addresses in the TON ecosystem has two characteristics that are notably different from those of other ecosystems. Firstly, while the number of daily active addresses has shown continuous growth, there is significant volatility. This phenomenon may be related to the timing of Token Generation Events (TGEs) within the TON ecosystem. The spikes in the number of daily active addresses have consistently coincided with TGEs or major events involving popular applications. This suggests that the number of long-term active users in the TON ecosystem is significantly lower than the daily active users and that the lifespan of user addresses for certain applications may be very short. Otherwise, there would not be such a sharp increase in transaction volume during TGE periods.

Figure 21: Trend of Daily Active Addresses on the TON Blockchain



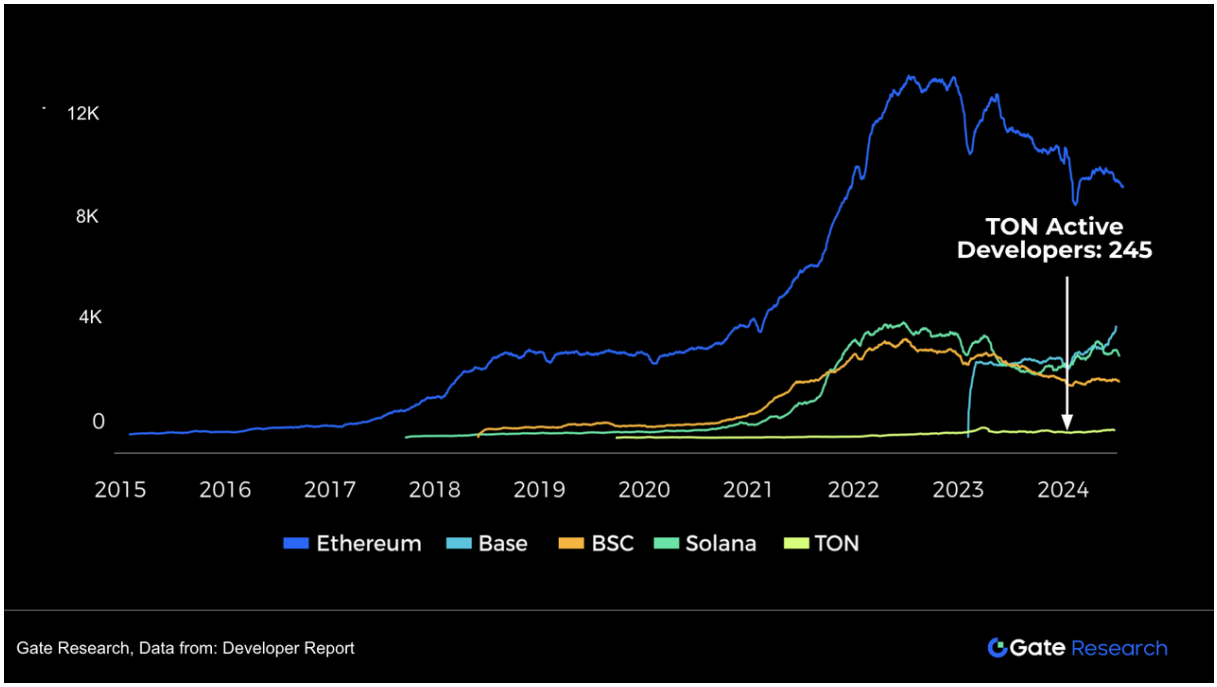
When aggregating the number of active addresses from several popular blockchains, the daily active addresses on the TON blockchain account for approximately 12%-13% of the total. The proportion of daily active addresses is more than twice that of its on-chain transaction volume (5%-6%). Although there is significant address activity within the TON ecosystem, there remains considerable room for improvement regarding on-chain activity frequency and user engagement. This may be due to TON attracting many non-Web3 users, who require a certain adaptation period for engaging with on-chain applications, as well as the relatively limited number of ecosystem applications available. The emergence of new high-quality applications could further encourage these addresses to participate in more on-chain activities.

Figure 22: Proportion of Daily Active Addresses on Popular Public Blockchains



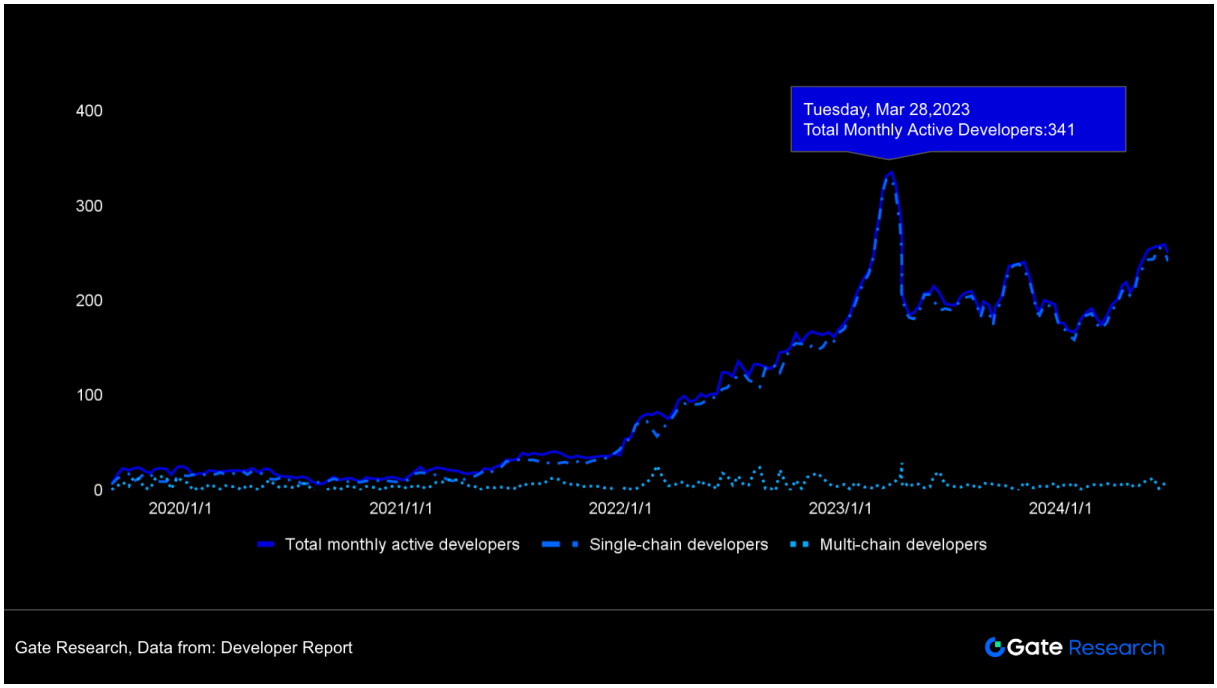
The TON Virtual Machine (TVM) is incompatible with the Ethereum Virtual Machine (EVM). The three programming languages available on TON—Fift, FunC, and Tact—differ significantly from the mainstream Web3 languages like Solidity and Rust. As a result, developers entering the TON ecosystem require a learning curve. Although the TON ecosystem is rapidly gaining traction and the number of active developers is growing quickly, it remains relatively small compared to other active ecosystems. Some contributors are exploring solutions such as EVM-compatible TON Layer 2 or other methods to reduce the complexity of development.

Figure 23: Trend of Active Developer Numbers on Popular Public Blockchains



At the beginning of 2023, possibly stimulated by several TON hackathons and grant programs, the number of active developers in the TON ecosystem saw rapid growth, reaching an all-time high. However, this number stabilized at around 200 developers, only starting to increase gradually to around 250 after the TON ecosystem gained significant popularity in 2024. TON also attracted a portion of multi-chain developers, but their numbers remained limited, only surpassing ten during the early stages of TON's development in 2023 and again after Q2 of 2024.

Figure 24: Trend of Changes in the Number of Active Developers on TON



6 TON's Advantages, Challenges, and Future Outlook

6.1 Advantages and Opportunities

As TON's initiator and current strategic partner, Telegram brings a vast user base to the TON ecosystem. In 2024, Telegram's monthly active users exceeded 950 million, with a significant presence in emerging markets. This provides TON with a clear advantage in user acquisition compared to other public blockchains, such as BNB Chain supported by Binance, Base supported by Coinbase, and Mantle supported by Bybit.

The potential Web3 user base has been stimulated by the popularity of "click-to-earn" games like Notcoin and Hamster. Following the successful listing of several well-known tokens on mainstream exchanges, more builders and investors have entered the TON ecosystem, further driving its development. Despite a significant increase in projects and token numbers in Q2 and Q3, TON still has considerable room for growth in terms of on-chain user acquisition.

The gaming narrative within the TON ecosystem is gradually evolving, with games like Catizen

demonstrating the purchasing power of Telegram users. Catizen announced that it has 750,000 paying users, with an Average Revenue Per Paying User (ARPPU) of $33, showcasing the potential of Telegram users to pay for high-quality products. Suppose new games within the TON ecosystem can introduce innovative gameplay and fully leverage Telegram's user base. In that case, they will have a greater opportunity to attract more paying users and generate sustained cash flow.

6.2 Challenges and Future Outlook

Although the TON ecosystem has developed rapidly, it still faces several challenges. Firstly, the number of applications within the TON ecosystem is relatively limited, particularly in the DeFi sector, where asset participation is insufficient. Currently, most of TON's Total Value Locked (TVL) comes from staking services, with limited use of other new assets within DeFi. Moreover, the daily trading volume of TON's DEX is relatively low compared to other multi-chain ecosystems. For instance, Telegram trading bots like Banana Gun can reach a daily trading volume of $20 million, while TON's DEX records a daily trading volume of less than $5 million.

Additionally, there is a trend of homogenization within the TON gaming ecosystem, with some applications offering similar services and gameplay. The reliance on similar social viral marketing methods has led to user overlap, making it more challenging to retain and attract non-Web3 users. In the future, TON may need greater innovation in game quality and gameplay to attract more users and maintain the momentum of its gaming narrative.

TON's progress in the DeFi space has been relatively slow. Most existing DeFi applications are web-based, resulting in a less-than-ideal user experience. Additionally, on-chain assets lack diversity, particularly with low supply levels of mainstream assets like USDT, ETH, and BTC. To further activate TON's DeFi ecosystem, more innovative DeFi applications and mechanisms will likely be required to attract these mainstream assets into the ecosystem.

Due to differences between its programming language and those used by mainstream blockchains, and the lack of compatibility between the TON Virtual Machine (TVM) and the Ethereum Virtual Machine (EVM), the development barrier for TON is quite high, leading to significant learning costs for builders. The number of active developers on TON is much lower than on mainstream blockchains like Ethereum and Solana. Despite a highly active ecosystem, the total number of applications on TON also lags behind these major blockchains. Developer education and incentives will remain critical strategic actions for TON's future growth.

Lastly, although the number of active addresses on TON has grown rapidly, user engagement on-chain remains low, with significant fluctuations in daily active users. The transaction volume has not yet matched the number of active users. In the future, TON will need more engaging applications to boost on-chain activities and further drive the growth of the entire ecosystem.

7 Conclusion

From an industry perspective, TON has opened up Telegram's treasure chest, building a bridge between Web3 and Telegram's 950 million social media users. The partnership between TON and Telegram has made TON the biggest beneficiary of this opportunity, resulting in significant breakthroughs in ecosystem applications, token market value, and user numbers. However, as other ecosystems compete for a share of the Telegram user base, TON must find the next narrative beyond mini-games and attract more developers and liquidity into its ecosystem to sustain growth. The unique form of Mini-apps, easier-to-spread marketing channels, and a new customer base are shaping new business models, offering new opportunities and possibilities for entrepreneurs.

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