



LIGHTPAPER 3.0

Revolutionary Digital Advertising Ecosystem
with Cross-Chain Interoperability

DATx Project Team
September 2018

Abstract

DATx is committed to building DATxChain as a high-performance blockchain under a unified protocol that will support the seamless transfer of different cryptocurrencies (e.g. Bitcoin, Ethereum, EOS, etc) on the DATx platform itself. Employing DATx X-DPOS consensus and cross-chain validators, as well as implementing atomic swap and sidechain functionality in the future, DATx will lay the foundation for a thriving blockchain industry that will no longer be limited by incompatible protocols. As infrastructure, DATx adopts a high-performance consensus mechanism and easy-to-update system architecture to fully utilize the open communication and convenience brought by token economy incentives and cross-chain technology. DATx will establish an ecosystem that encourages DAPP development and improves user experience.

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Executive Summary

With the proliferation of blockchain projects, we are seeing blockchain use cases in a broad spectrum of industries. But at the same time, the blockchain industry has become more fragmented than ever before, with each blockchain project supporting only their own native platform currencies.

We are now at a critical point in blockchain development where the future feasibility of decentralization is at stake. Without intercommunication protocols between chains, blockchain projects will further splinter, making it even more difficult for widespread blockchain adoption.

Blockchain interoperability will be our Tower of Babel, allowing blockchain technology to fully realize its potential by opening up channels of communication between a variety of decentralized systems. Decentralization does not have to mean widespread incompatibility.

DATx is dedicated to building a high performance interoperable blockchain, the DATxChain, that will allow seamless transfers of various cryptocurrencies (e.g. Bitcoin, Ethereum, EOS) directly on the DATx platform.

We have developed the DATx X-DPOS consensus mechanism to meet these needs. The X-DPOS consensus mechanism will achieve TPS speeds demonstrated by other DPOS projects while incorporating cross-chain validators to ensure efficiency and security in DATxChain multi-asset support.

DATx will create the infrastructure necessary to cultivate an ecosystem of DAPPs that will take full advantage of the efficiency and ease of communication promised by interoperability. To attract DAPP developers, DAPP development will be incentivized through our token economic model.

This paper will explain DATx's vision and philosophy, detailing the technological underpinnings and economic model for a next generation blockchain interoperability solution.



DATx Mission

1.1 Implementation in Digital Advertising Industry

Based on a decentralized protocol, DATx is committed to building a secure, sustainable, efficient, and effective digital advertising ecosystem through blockchain technology's ability to realize secure distributed storage. Through encouraging user interaction with advertisements through programmed incentive mechanisms on the blockchain, DATx proposed a new digital advertising model that is mutualistic and beneficial for all parties - users, media publishers, and advertisers.

Prior to this lightpaper, DATx had successfully completed full DATx integration with the APX (Avazu Private Exchange) platform as the platform's sole supported digital currency. APX has successfully integrated DATx payment support functionality for both publishers and advertisers. APX publishers using DATx not only enjoy short settlement periods, low commission rates, and safe transactions but receive DATx token rewards during the promotional period. APX advertisers using DATx can now call the advertiser application interface and display and billing interface to create comprehensive DATx digital advertising bills. Subsequent updates will provide real-time ad performance tracking capabilities for advertisers paying in DATx token.

Concurrently, DATx has also completed the demo for our main chain, DATxChain. DATxChain has been optimized for the high concurrency and real-time delivery required by the digital advertising industry to achieve high TPS and scalability. The main network demo internal test saw the successful implementation of node communication, automatic network, multi-node consensus, block structure definition, encryption optimization, and plug-in architecture.

Next, DATxChain development will focus on optimizing system architecture, realizing the X-DPOS consensus mechanism, and establishing smart contract functionality.



1.2 Expansion to Cross-Chain

The DATx project has worked to address issues in the digital advertising industry that the current internet framework is unable to resolve – the absence of users from digital advertising value chains, data security pitfalls, the “walled garden” phenomenon, and wasted bandwidth from ineffective targeting technology. These issues stem from the internet’s foundations. Therefore, blockchain, a structural reorganization of the internet, carries high potential in solving these issues.

The token economy, along with the blockchain technology, has created a new relationship between equity and production through decentralization. Ironically, while blockchain platforms decentralize industries they are established in, the platforms themselves are isolated from each other, creating a “walled garden” phenomenon similar to what we have been working to address in the centralized digital advertising industry.

The more projects increase in number, the more fragmented the entire industry becomes, because blockchains are not interoperable – value and data cannot be exchanged across platforms. There are criticisms that the current blockchain infrastructure is less blockchain and more intranet.

Furthermore, there are still various pressing and systemic issues within the blockchain industry. Assets are not reasonably valued due to fluctuations from volatility resulting from fragmented token economies. While exchanges enable a very basic form of value interoperability, they must store vast amounts of currencies from different blockchains on centralized accounts, making them vulnerable to hacks.

These problems can be solved by interoperability. Cross-chain interoperability protects blockchain currencies from violent price fluctuations, which impacts blockchain project launches, user adoption of blockchain services, and development of blockchain technology. It also allows digital assets and currencies to remain decentralized, ensuring security of funds. With interoperability across the industry, fragmented user bases across blockchain platforms can be united, allowing the industry to more easily reach critical mass for wide adoption and actually realize potential use cases at a commercial scale.



Blockchain technology can bring real innovation to the digital advertising industry only through a unified agreement to build and improve infrastructure that supports interoperability. And so we believe that decentralized digital advertising will overtake traditional digital advertising once we achieve cross-chain compatibility.



Current Challenges

2.1 Challenges for DAPP Developers:

Despite the paradigm shift DAPPs (decentralized applications) promised to bring - opening the door for increased user functionality - user adoption of DAPPs has been muted. Figures reflect the scope of this issue. Despite the growing number of DAPPs, only eight DAPPs are able to draw in more than 300 daily active users. Five of these apps are on Ethereum, while three are on EOS. As these numbers indicate, DAPPs are currently failing to catch and hold onto users. This is due to a number of factors:

- **“Walled Garden” of DAPPs**

Even though public blockchain projects have exploded in number in the past few years, DAPPs are still stuck operating solely on the native token/coin of the blockchain platform they were developed on. EOS developers are unable to reach Ethereum users and vice versa. Without interoperability, each blockchain has become a walled garden for DAPPs, restricting the reach of DAPPs to their native chain’s user base.

- **High Barriers to Switching Chains**

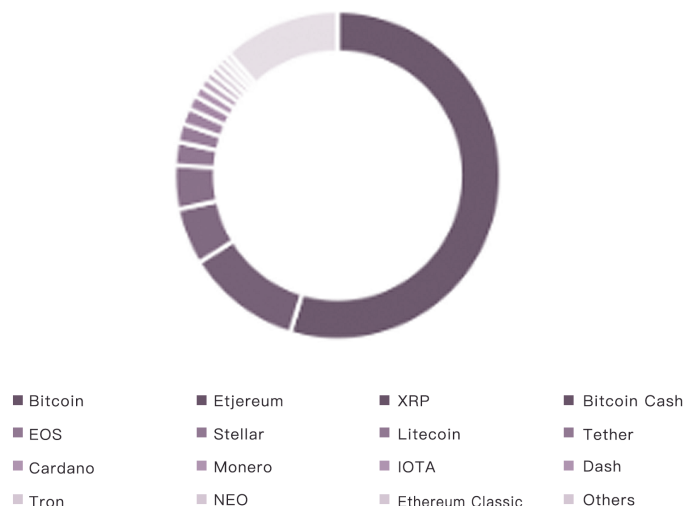
Without interoperability between blockchains, DAPP developers must hedge their bets on developing on only one compatible platform out of hundreds of diverse and specialized options. This greatly limits blockchain technology from achieving the promised revolutionary goal of large scale decentralization.

For example, if one blockchain were suddenly to have a new update that makes it more suitable for a DAPP from another chain, the developer faces a major barrier in jumping to another chain. The developer would not only need to redevelop according to the specifications of a new chain, possibly needing to learn an entirely new coding language, but would need to build a new user base from scratch. This has the effect of stifling competition between chains, as the hurdles for choosing a different chain is too high.



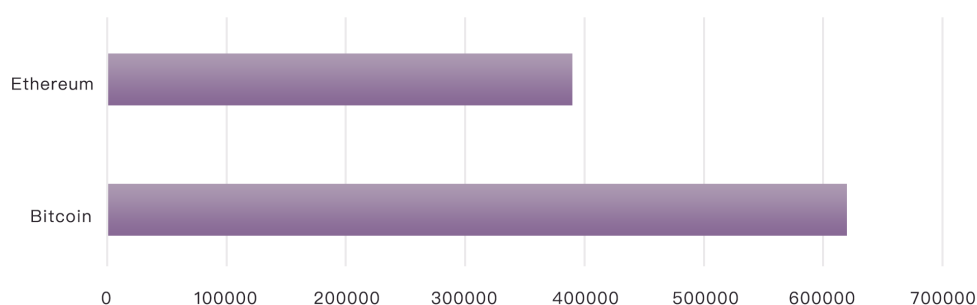
● Lack of Options

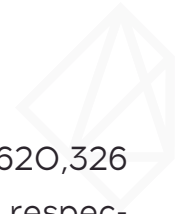
Figure 1. Market Capacity Breakdown by Project



As of 2018 September, 6, the total market capitalization of the blockchain industry stands at \$203,748,784,235 USD according to CoinMarketCap. However, over half of that is in Bitcoin (\$111,416,672,467 USD), the oldest cryptocurrency. This is despite the fact that there are now thousands of blockchain platforms, all rapidly advancing blockchain technology development that have already rendered Bitcoin protocol outdated and inefficient. The reason for Bitcoin's continued domination is that user bases must reach critical mass before average token holders feel secure in switching to another blockchain platform. This inertia stifles user base growth for newer platforms and concentrates value to a select few projects, limiting DAPP developer options.

Figure 2. Active Addresses by Blockchain(24 Hour)





According to BitInfoCharts, as of 2018 September 6, there are currently 620,326 active addresses and 390,872 active addresses on Bitcoin and Ethereum respectively (within 24 hours). However, Bitcoin doesn't support DAPPs. In fact, of the top 15 blockchain platforms, only four platforms, representing 15% of the total blockchain market capacity, are currently running DAPPs: Ethereum, EOS, Stellar, and NEO. This presents a major loss of opportunity for DAPP developers.

2.2 Challenges for Users:

In the future, DAPPs will serve as the main source of traffic for blockchain platforms. Currently, users must invest in tokens/coins of one blockchain platform to utilize its DAPPs. However, when users want to access a high quality DAPP from a different platform, they must exchange their assets for this DAPP's native blockchain's tokens/coins. It's as if each DAPP were a smartphone app, and to use different apps, you would need multiple bank cards holding different currencies. This presents four major problems:

- **Token Price Volatility**

There is an inherent volatility in such a fragmented blockchain industry. Large price swings mean using DAPPs is a gamble. The actual value spent on DAPP services may change quickly in a short span of time, making it difficult to determine whether a DAPP is worth using.

- **Security Issues on Exchanges**

Currently, the only way to access resources and DAPPs on a different platform is through bringing one's tokens to an exchange. While decentralized exchanges exist, they are too difficult for regular users to navigate and suffer from small user bases and low liquidity. Centralized exchanges, while being more user friendly, are prime targets for hackers. There is no shortage of high profile hacks, which have been the cause of mass panics leading to large price fluctuations. So far this year, \$731 million USD has already been stolen as a result of crypto exchange hacks.



● Wasted Time

Not only do exchanges present security issues, token trading is a time-consuming process. Trading requires depositing tokens onto the exchange platform through your wallet, exchanging for the desired token, then transferring back the token to a new wallet. For Bitcoin transactions, traders can expect this process to take at least one hour on an average day. This is a considerable hindrance in using time-dependent DAPPs.

● Security Issues for Tokens

When users access DAPPs, users have no choice in which token to use. They are subject to risks from not just DAPP contracts but the blockchain platform itself. Take for example the current controversy facing Fomo3D, one of the five Ethereum-based DAPPs drawing in more than 300 daily active users mentioned in the previous section. On August 23, after the end of the game's first round, which paid out a grand prize of 10,469.66 Ethers, Secbit Labs released an article exposing how the competition was rigged. By exploiting the Ethereum blockchain's block validation model of prioritizing high transaction fee transactions, a user was able to block out other players from adding more ETH to the pot, thereby guaranteeing the last player the win. The takeaway from this is that for users, a DAPP is only as reliable as the supported currency.



Solution

● The Vision

DATx was developed to establish a decentralized system that facilitates mutualistic interactions between all participants, encouraging innovation and development through fostering a transparent economy and a strong DAPP ecosystem.

To achieve this, cross-chain interoperability will be key. Through cross-chain communication, blockchain technology will flourish, realizing a viable and efficient decentralized future for all.

By supporting multiple assets in the DATx ecosystem, users and DAPP developers have access to the resources of not only DATxChain, but all other supported chains.

● The Plan

The DATx team believes that interoperability will be able to solve the aforementioned challenges currently facing the blockchain industry.

In order to help developers reach a larger user base and mitigate the cost of developing on multiple different platforms or migrating platforms, a developer friendly platform should support multiple assets. DAPPs that support multiple assets are also protected from security vulnerabilities of any single blockchain platform.

This will eliminate the need to switch chains, address the lack of blockchain platform options, and break through the “walled gardens” of other blockchains.

With such a diversity of blockchains serving different use cases, the question arises: why do token holders even need to “switch platforms” at all? A blockchain supporting interoperability means that users from different platforms don’t need to switch; a user of an interoperable blockchain is also a user of all other supported blockchains. This is a win-win situation for the entire blockchain industry.

Furthermore, in order to protect user data and security and create a transparent



platform, a user-friendly platform should not rely too much on third-party centralization institutions to provide users the ability to access blockchain products. With DAPPs being the interface end users interact with, stronger user experience through providing multi-asset support will better attract and retain users.

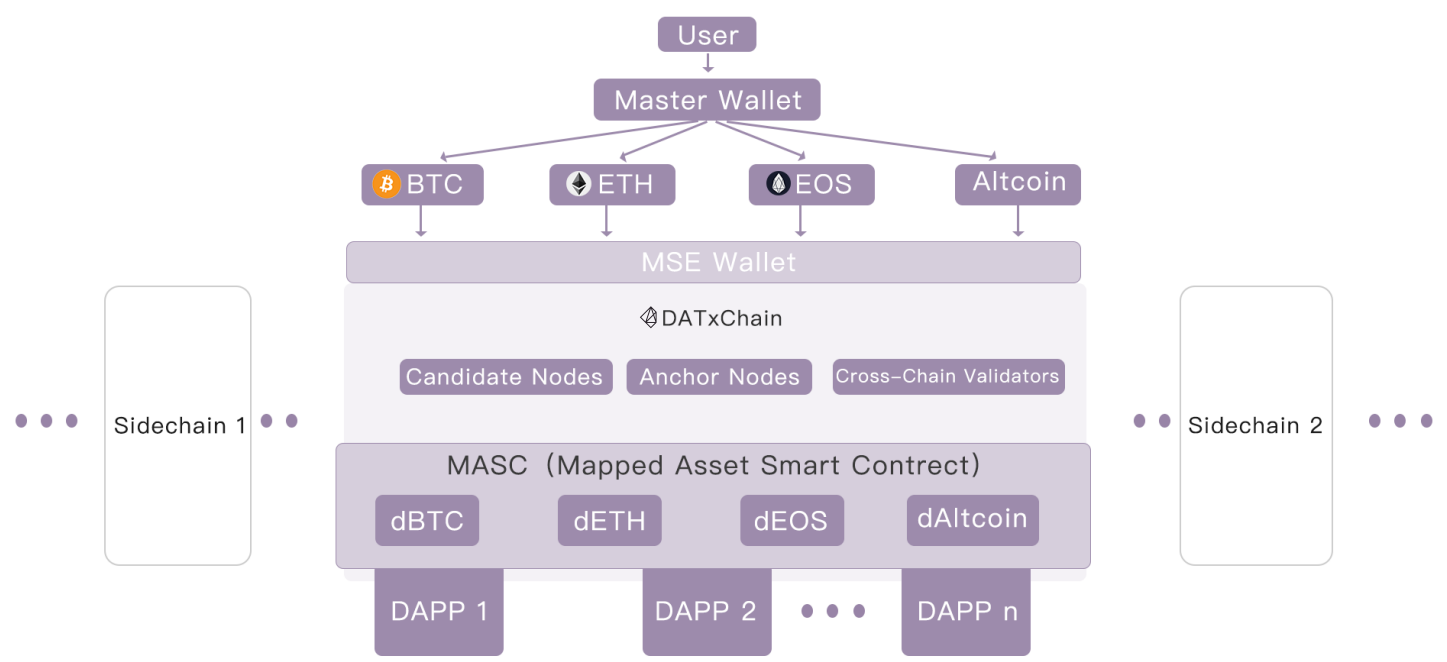
This will address token price volatility and single token security issues, eliminating issues of exchange security and wasted time on exchanging tokens.

When cross-chain interoperability becomes established in the industry, only platforms that provide multi asset support and one stop decentralized services will remain competitive in attracting ordinary users and DAPP developers.



Implementation

Figure 3. DATxChain Cross-Chain Protocol



DATx will be launching the DATxChain as a Turing-complete cross-currency development platform, powered by an underlying high performance blockchain. DAPP developers can use DATxChain’s smart contract protocol to develop DAPPs supporting multi chain assets, allowing users to access DAPPs with assets outside of DATx.

1. Through DATxChain’s multi-asset on-chain wallet, DATxWallet, users can bind their off-chain wallet (to prove ownership of assets) when they are ready to deposit off-chain assets. The binding process is completely decentralized; user private keys will not be logged during this process.
2. The funds will be deposited into a multi-signature escrow wallet, MSE Wallet, corresponding to the bound BTC wallet, ETH wallet, or other supported currency wallet.
3. Anchor nodes on the DATxChain will monitor for the deposit transaction



via the Meridians plugin, a cross-chain protocol plugin, and invoke the MASC (mapped asset smart contract).

4. Once the MASC is successfully executed and irreversible, it will transfer the corresponding mapped assets to the user's DATx Wallet.
5. Users can use these mapped assets to access DATx Chain-based DAPPs.
6. For permission to withdraw their off-chain assets, users can return their mapped assets to their mapped asset account in DATx Wallet.
7. Once authorization requirements are met, cross-chain nodes will initiate a cash withdrawal proposal. When more than $2/3$ of the cross-chain nodes sign off, the off-chain asset will be returned to the bound wallet.

DAPP developers can use the DATxChain smart contract protocol supporting off-chain assets and users will be able to access DAPPS on the chain using DATx assets along with off-chain assets.

In order to realize this, we have made significant breakthroughs focusing on five focal points:

- ◆ Meridians Plugin (Cross-Chain Protocol Plugin)
- ◆ DATxWallet
- ◆ X-DPOS
- ◆ Off-Chain Asset Deposit/Withdrawal Function on the DATxChain
- ◆ MASC (Mapped Asset Smart Contract)



Key Features Overview

DATx is based on a plugin architectural model, allowing for ease of updates and adding new functionalities. The DATx system contains the following core components and key terminologies:

- **DAPP (Decentralized Application)**

An app with a backend code that runs on a P2P decentralized network, in contrast to apps where the backend code runs on a centralized server.

- **dBTC/dETH/dEOS (debited BTC/ ETH/ EOS)**

The form taken by mapped asset coins/tokens on the **DATxChain**. In this context, debit means an entry corresponding to a user's asset remaining in the escrow account (**MSE Wallet**).

- **DATxChain**

The mainnet of the DATx blockchain.

- **DATxWallet**

The **on-chain** wallet showing assets corresponding assets the wallet holder owns on the **DATxChain**. A **DATxWallet** holds DATx token and other DATx assets, along with mapped assets in the form of **dBTC/dETH/dEOS**.

- **LSP (Listening Server Program)**

A module on DATx **nodes** that constantly checks for transactions between **off-chain** accounts and the **MSE Wallet** to verify **off-chain** transactions have taken place.

- **Mapped Asset**

Supported **off-chain** assets mapped onto the **DATxChain**. They take on a debited



form corresponding to the amount in the **MSE Wallet**, and show up in the **DATxWallet** as **dBTC/dETH/dEOS**, etc.

- **MASC (Mapped Asset Smart Contract)**

The smart contract that controls the creation, transfer, withdrawal, and deposit of **mapped assets**.

- **Master Wallet**

An **off-chain** wallet that provides an interface showing assets from multiple blockchains. Allows for easier multi-asset management of funds.

- **Meridians Plugin**

A plugin integrating cross-chain communication, off-chain monitoring, transaction verification, and other cross-chain related functions. Allows plugins to provide secure, reliable, and complete cross-chain services. Is also part of the DATx client.

- **MSE Wallet (Multi-Signature Escrow Wallet)**

The **off-chain** wallet that holds user funds in escrow when they deposit their funds for use on **DATxChain**-based DAPPs. Requires multi-signature sign off for funds to be moved to ensure security for all parties in the ecosystem.

- **Multi-Signature Module**

A module on **nodes** that coordinate the multi-signature validation process for cross-chain validators.

- **Nodes**

Contain all records for **DATxChain**. They are differentiated into anchor nodes, cross-chain validators, and candidate nodes.

- **On-Chain Asset**

Assets on the **DATxChain** such as DATx token, other DATx assets, and **mapped**



assets (dBTC/dETH/dEOS, etc).

- **Off-Chain Asset**

Assets not on the **DATxChain** such as BTC/ETH/EOS, etc.

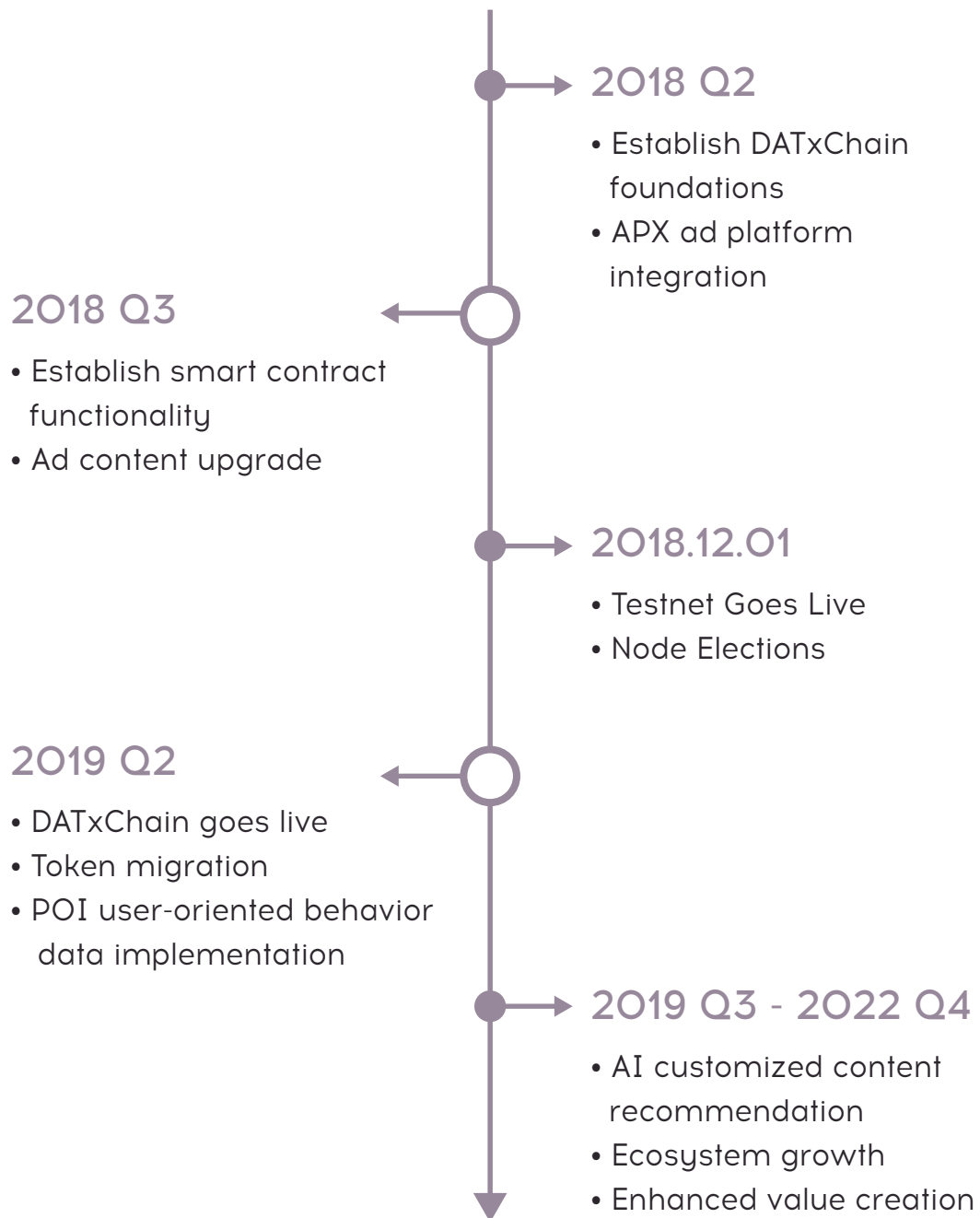
- **X-DPOS (Cross Delegated Proof of Stake)**

A modified delegated proof of stake mechanism that supports high performance cross-chain interoperability.



Roadmap

Figure 8. DATxChain Development Roadmap





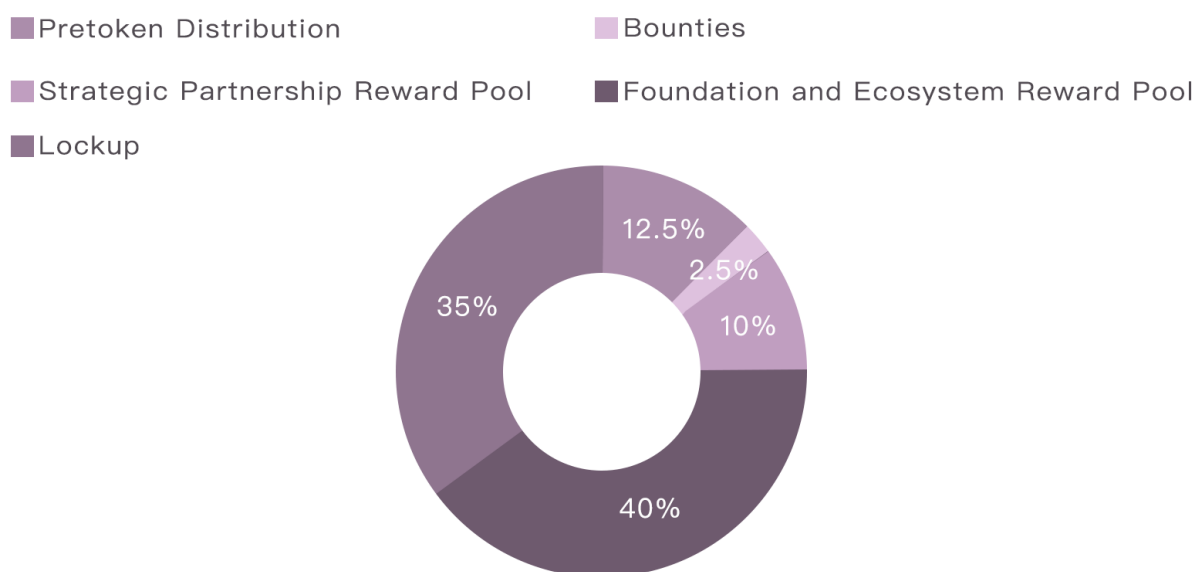
Token Economy

DATx token is the native token of DATxChain, stored in the DATxWallet. DATx token provides token holders with voting rights and resource rights in the DATx ecosystem, such as accessing DAPP services.

Before launch, 10 billion DATx tokens were premined. These tokens are allocated as follows:

Figure 9. DATx Token Allocation

Total Amount: 10 Billion DATx Token



7.1 Pretoken Distribution (1.25 billion DATx)

The pretoken distribution from February 2018 was carried out through a strict KYC procedure, with DATx tokens open for public sale. As a result, this 12.5% of the total DATx token amount has already been circulating among the public and on secondary markets such as exchanges.



7.2 Bounties (0.25 billion DATx)

The DATx team has carried out two rounds of airdrop bounties with a total of 2.5% of total DATx token allocated. Not all the bounties have been distributed at the time of writing.

7.3 Strategic Partnership Reward Pool (1 billion DATx)

The strategic partnership reward pool, at 10% of the total token amount, is reserved for DATx strategic partners.

7.4 Foundation and Ecosystem Reward Pool (4 billion DATx)

The foundation and ecosystem reward pool, at 40% of the total token amount, will be set aside for funding the development of the DATx ecosystem and sustaining the foundation.

7.5 Lockup (3.5 billion DATx)

The lockup pool, at 35% of the total token amount, will be unlocked after the launch of the mainnet, DATxChain. The lockup is split as follows:

7.5.1 Arbitration Commission Reward Pool (1 billion DATx): The arbitration commission reward pool, at 10% of the total token amount, is reserved for members of the DATx arbitration commission.

7.5.2 Node Reward Fund (2.5 billion DATx): The node reward fund, at 25% of the total token amount, will serve to compensate anchor nodes and cross-chain validators for their computing power and storage. There will be a yearly release of 1 billion DATx tokens from this pool, serving as inflation in the DATx token economy. This 1 billion DATx token will be rewarded according to the following percentages: 40% for all candidate nodes (includes anchor nodes and cross-chain validators), 35% for cross-chain validators, and 25% for anchor nodes.



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