TAU Network:

Fast and efficient L1 network

admin@taunetwork.io
pony@taunetwork.io

April 23, 2022

TAUpi

Contents

This paper gives an overview of TAU Network*, a layer-1 blockchain platform. TAU focuses on chain optimization for DAPP and bridge and NFT, helping DAPP developers and other content providers to create a new, user-friendly experience with their digital assets. TAU is built using Cosmos SDK, the most popular framework for building blockchains, that powers Pi Network, BNB Smart Chain, Terra, Cosmos Hub, and many other chains.*

1 Context

Since the birth of Bitcoin in 2009, the crypto market has grown to thousands of billions of US dollars in size.

Usability is a key factor in almost all software products that end-users interact with. Most of the current DAPP schemes are based on Ethereum, thus they inherit drawbacks such as low throughput, expensive transaction fees, and environmental impact, from the Ethereum network as well. While the Ethereum community is working towards a more scalable and sustainable ecosystem with *Eth2*, it is still a long way until all the upgrades are in place. Alternatively, other blockchains with much better usability emerge such as Flow or BNB Smart Chain (BSC). While non of the alternative choices is as popular as Ethereum, these blockchain platforms offer a much better user experience and are more suitable for different use cases.

There is little *interoperability* among different NFT ecosystems. There is currently no way to directly transmit an NFT from Ethereum to BSC yet. While cross-chain communications are blooming, it is still some time before we can see all of these advancements work with NFT. While the major NFT schemes are concentrated in Ethereum, this problem prevents the wide adoption of the technology to other blockchain platforms.

What is the most popular blockchain platform for ? Despite all drawbacks in the usability of Ethereum, defi transaction value on the platform still dominates the market by more than 85% (March 2022). Following the chart are Ethereum competitors such as Solana, Avalanche, etc. There is little difference between creating DAPP on one platform and another. Hence it is extremely difficult for these platforms to compete with

Ethereum as users are already much familiar with all the tools, wallets, and high liquidity marketplaces like OpenSea. Top blockchain platforms like Solana, BNB smart chain, Avalanche, etc. are having their own NFT marketplaces and games, mostly by investing a lot of capital in startups, game studios, or leveraging their existing crypto community.

When a business chooses a blockchain to create NFT, there are several things to consider such as transaction cost, robustness, security, speed, community, usability, interoperability, etc. It is difficult to have one that gets all of these characteristics. Some NFT projects that thrive to reach the next level of innovation choose another approach, that is to make their own blockchain network e.g. Ronin and Flow so that they can optimize and tailor it to have their desired quality. We believe that this bottom-up approach is the correct way of solving the usability and interoperability problems described above. There should be more layer-1 blockchains that can be optimized for specific purposes, governance and secured by communities that share the same trait or interest. Thus, applications on top of these blockchains can have more customization for their target customers. Eventually, these chains can be connected through various cross-chain communication protocols to create a network effect to bring more utility for tokens.

2 Introducing TAU Network

We introduce *TAU Network*, an DAPP-centric, layer-1 blockchain that focuses on expanding the use of DAPP across various industries. Our vision is to create a one-stop destination for minting, evaluating, querying, and transacting DAPP, to become a pioneer DAPP infrastructure for the future. TAU Network focuses on building a *sovereign blockchain* that is optimized for DAPP use cases. This section provides a high-level view of the vision of TAU Network.

2.1 Sovereign blockchain

TAU Network is a *sovereign blockchain*. That means having its own decentralized infrastructure that can be governed independently by TAU Community rather than depending

on other layer-1 chains. Ecosystems like Ethereum or Solana are trying to have everything built on top of it, this makes these networks eventually be congested with too many unrelated transactions that can only be solved by sacrificing either security or decentralization. Even then, it takes a long time to update these networks as every change might cause a significant impact on existing applications. By building a sovereign, DAPP-centric blockchain, TAU will have more freedom to optimize the platform to give better performance, security and utility for NFT applications.

2.2 Optimizing and scaling for IP owners

TAU focuses on helping *brands*, *influencers*, *IP owners*, and *game creators* by providing a way to tokenize their digital assets to create a unique experience using DAPP. TAU's thesis on building the next level DAPP eco-system evolves around this customer segment is as follows:

- **Bottom-up optimization**: By working directly with content providers or owners, TAU gradually optimizes the platform both in terms of technical capacity and utilities for accelerating the building process based decentralized applications.
- **Geological scaling**: TAU shares the view of Ethan Buchman - *co-founder of Cosmos* on blockchain scalability via geo-local systems. It is to bridge the gap between the platform and the customer it serves by providing support for local communities. Eventually, successful applications building on top of TAU from one local community can be easily replicated and customized to fit other communities that share the same attributes such as culture, language, countries, etc.
- **Maximize interoperability**: Pushing bottom-up development is not scalable in the long term. Eventually, this approach will meet top-down systems like Ethereum or Solana at some point. By adopting global standards, integrating with bridges and inter-blockchain communication protocol, TAU can help local brands and content providers to scale their applications and products to the global market.

In developing this thesis, TAU is one of the pioneer platforms that help local businesses, IP owners and game studios to tokenize their portfolios and scale to a global level. This will help bring more end-users from the mainstream traditional market into the metaverse ecosystem. This is the key step in improving the awareness about and utility of NFT as it then can be used widely even in traditional finance.

2.3 A universal framework for NFT

The original Ethereum token standards ERC-721 and ERC-1155 laid a foundation for NFT standard interfaces. How these tokens are created and used in DApps depends on the creativity of developers. It is also the source of complexity in developing DApps. There are well-known middleware solutions to tackle this complexity such as *Infura* or *Metaplex* but mostly they are tools and managed services helping application developers to outsource the complexity of key management or blockchain client integration. TAU Network takes it to the next level by not only developing middleware services and open-source smart contract templates but also supporting integration with local services such as payment gateways, e-commerce platforms, social networks, etc. With such built-in support tools, TAU Network helps to accelerate not only creating new DApps, but also creating a whole new NFT business easily.

2.4 Maximizing interoperability

With the success of Bitcoin, Ethereum, Cardano, and others, a lot of crypto project was born, creating many isolated blockchain networks. With multiple blockchains coexisting, cross-chain communication solutions emerge. Atomic swap, cross-chain messages, inter-blockchain communication protocols are all examples of the capability to link different blockchains together to create a more cohesive ecosystem that benefits everyone.

Interoperability is a key part of the thesis of building TAU Network. Inter-connectivity and bridging are major forces driving the success of DeFi.

3 Architecture

In this section, we will present the high-level software architecture of the TAU Network ecosystem.

3.1 Blockchain Platform

The TAU Network Blockchain platform is a *Layer-1 blockchain* built using *Cosmos SDK* [2]. The Cosmos SDK is an open-source framework for building proof-of-stake blockchains. It allows developers to create a blockchain platform from scratch with interoperability with other blockchain platforms.

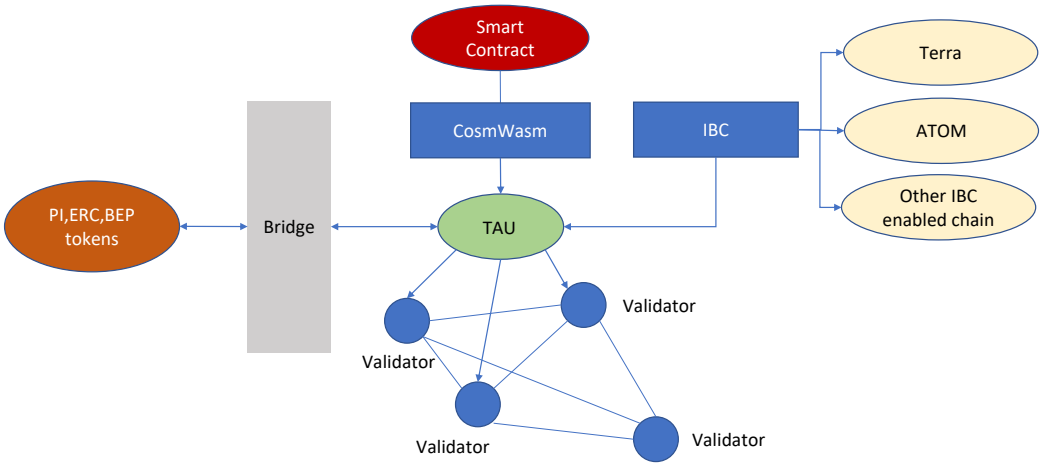


Figure 1: The TAU Network blockchain architecture

Figure 1 shows the high-level architecture of the TAU blockchain platform. There are several main components that we want to highlight in this architecture:

Validator

Validators are blockchain nodes that participate in the consensus process to confirm transactions and produce blocks. The consensus engine is *Tendermint* [1], a Byzantine Fault Tolerance state machine replication engine while the Proof-of-Stake (PoS) logic layer is provided by the Cosmos SDK.

TAU

taud, the short form of “TAU Daemon" refers to the compiled platform binary that runs on all Validator nodes. taud contains standard Cosmos modules like *Auth*, *Bank*, *Mint*, *Slash*, *Stake*, etc. that are required to run the blockchain platform. There are a few simple modifications such as adding parameters and specific business logic that may be required by the TAU tokenomics. But overall, there won’t be much change from the provided modules from Cosmos.

CosmWasm

CosmWasm stands for “Cosmos WebAssembly", it’s a Cosmos module that enables WebAssembly virtual machines in the cosmos SDK. As the smart contract written for CosmWasm is compatible with all other Cosmos-based blockchains, we choose CosmWasm as the middleware for building smart contracts and DApps for the TAU ecosystem. Currently, it only supports contracts written in *Rust*, but many high-level programming languages can be added in the future.

IBC

Inter-Blockchain Communication Protocol (IBC) is the signature Cosmos module that supports transferring tokens directly from one chain to another. TAU Network enables IBC by default so that moving TAU Coin to Terra, Atom, Osmosis or other IBC-enabled blockchains can be performed easily.

Bridge

Bridge is also an important part of taud. As TAU Network focuses on bridging assets to other blockchains even outside of the Cosmos SDK, bridge solutions that support ERC-20, BEP-20 tokens will be employed. We are in contact with some decentralized exchanges and bridge teams e.g. Impossible Finance to develop this component.

3.2 TAU Network ecosystem

Figure 3.2 shows the potential building blocks of the TAU Network. At the moment, we divide the ecosystem into 6 main categories

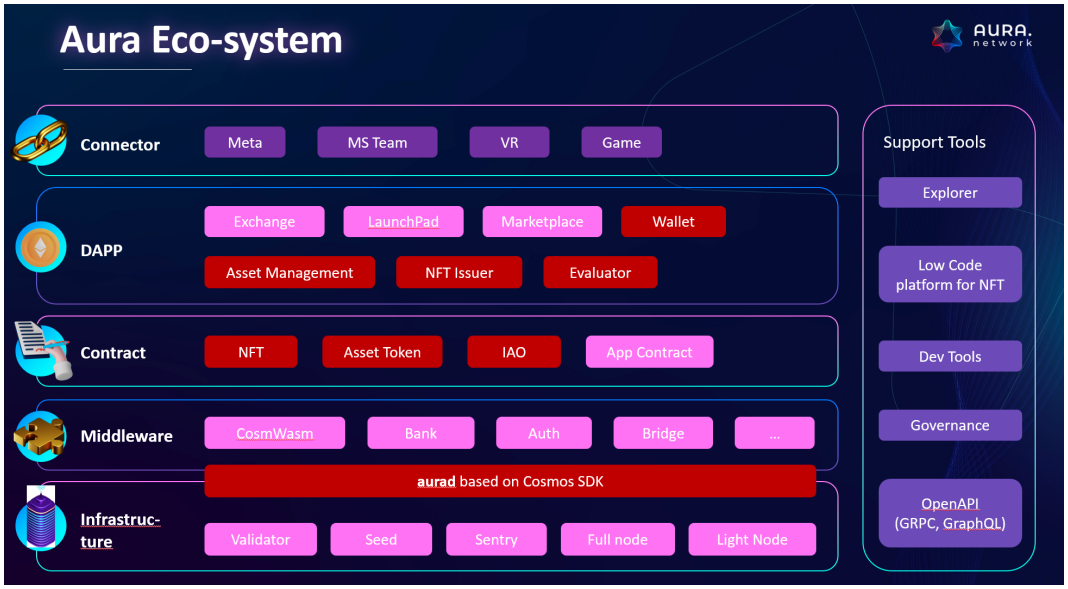


Figure 2: The TAU eco-system

Infrastructure

The Infrastructure layer mostly refers to the blockchain platform that is mentioned above. Other than validators, Cosmos and Tendermint's best practices in running production software also include Seed, Sentry, Full and Light nodes. Details on the setup of these nodes are described in the Cosmos SDK documentation. We will also provide

scripts and instructions on how to set up different types of nodes later on through TAU development documents.

Middleware

The middleware layer contains Cosmos modules bundled together with taud. As mentioned, most of the provided Cosmos modules are included. The TAU team also publishes modifications to these modules in the development docs as well.

Smart Contract

The smart contract layer contains smart contracts written in Rust, compiled, and run on the CosmWasm module.

Decentralized App

Decentralized Applications (DApps) are the main focus of the TAU Network. All business solutions are written here such as Asset Management, Wallet, DAPP, NFT Issuer, NFT evaluation, Exchange, Launchpad, Marketplace, etc. The TAU team will take the lead in developing these DApps to attract all types of stakeholders as mentioned in the introduction section.

Connector

The connector layer contains integration APIs, SDKs that are used to bring NFT assets to Metaverse networks. By itself, TAU Network does not provide a metaverse experience but provides infrastructures for bringing NFT assets to the metaverse.

Support Tools

This layer contains usual software tools that are mandatory to the TAU blockchain platform. That contains blockchain explorer, low code software development, development tools, OpenAPI, and Governance tools.

4 Tokenomics

This section describes information related to a native currency supported by the TAU Network.

4.1 Token Usage

We introduce 2 types of native tokens in the TAU Network: the TAU Token on BNB Smart Chain and TAU Coin.

4.1.1 TAU Token on BSC

Before launching Mainnet, TAU first introduces the BEP-20 TAU Token on BNB Smart Chain. This token acts as a placeholder for the later TAU Coin that will be introduced when TAU Mainnet launches. Like other BEP-20 tokens, TAU Token can be freely traded on the cryptocurrency market. TAU Token also helps provide liquidity on BEP-20 compatible decentralized exchange and bootstrap users from this community.(The Mainnet exchange rules will be announced later)

On the BSC chain, we adopt the way of Mint and need to mint with a small amount of gas cost.

Rules	Number	Address total	Total	Circulation	Get the way
Swap pool	6280000000.00	1	6280000000.00	62800000000.00	Don't need
1-10	628000000.00	10	6280000000.00		Mint
11-100	62800000.00	90	5652000000.00		Mint
101-1000	6280000.00	900	5652000000.00		Mint
1001-10000	628000.00	9000	5652000000.00		Mint
10001-100000	62800.00	90000	5652000000.00		Mint
100001-1000000	6280.00	900000	5652000000.00		Mint
After 10000001	3140.00	7000000	21980000000.00		Mint

4.1.2 TAU Coin

TAU Coin is the native currency of the TAU Network blockchain platform. Besides the trading capability of TAU Token, TAU Coin has many other utilities:

- **Staking**: TAU Coin holders can delegate their coins to trusted validators to earn passive commission income from the network.
- **Governing**: TAU Coin holders can participate in voting for software updates or other important decisions on how the TAU community should be developed.
- **Transaction fee**: TAU Coin is used to pay for transaction fee.
- **Exchange and Swap**: TAU Coin can be exchanged or swapped in the market.

4.1.3 Ecosystem Growth

20 percent of the total coin will be allocated to the ecosystem growth fund. This fund is used for ecosystem development such as project grants, bug bounties, attracting stakeholders to provide utility services, etc. Examples include, but are not limited, to the following:

1. **Airdrop and reward:**
   Built on the Cosmos SDK system, we would like to reach the most active participants on the same system. As such, some TAU tokens will be dropped to ATOM and other tokens in the Cosmos system. The drop is either in a fixed quantity (in the spirit of Uniswap), or proportional to staked tokens. Tokens are claimable conditional on some criteria such as the length of staking, the minimum quantity of qualified tokens staked, participation in governance voting, or engaging with the community in any social media such as Telegram or Discord, etc. We will also consider airdropping some random Fan Tokens to TAU token holders to encourage people to hold TAU tokens on a long-term basis.
2. **Community pool:**
   Developing and expanding network reach requires tokens as a source of capital, which can be financed from the Community pool. A stakeholder (can be a validator, advisor, or influential participant of the network) can write up a proposal and specify the requested quantity of tokens, the purpose of using tokens, the timeline

of the plan, and any expected result. The proposal is then to be voted Yes or No on the majority rule basis. That is, if a proposal receives more than 50% Yes votes, it will be implemented, and vice versa. The voter can be validators and/or token holders. Token holders can delegate their coin to their choice validator to increase the weight on the cast of that validator. The weight is proportional to the total amount of tokens available to all voters at the time of voting. The process is designed to be democratic, and proposals that are unambiguously beneficial to the network and stakeholders should pass most of the time.

There will be a time when a proposal is controversial in the sense that the benefit-cost is ambiguous to the voters. As such, we would like to collect feedback from the No voters on why they downvote the proposal. We propose that when choosing No, there is another question for why the voters choose no, and the answer is to be chosen in a multiple-choice format. This mechanism would help proposers to improve on their proposals for the following-up rounds.

3. **Bug bounty**:
   Some tokens will be allocated to users who report bugs and propose fixes to the network.

4.1.4 Foundation Reserve

10 percent of the total coin will be stored in the foundation treasury fund. It is supposed to be served as a last-resort in the case that the network requires funds to solve a particular problem that another source of funding (e.g Community Pooling) is not on the table. All decisions on how to spend the fund must go through a public governance proposal as outlined in the Community Pool subsection.

4.1.5 Team

20 percent of the total coin goes to the TAU team to incentivize the developer to expend their effort in building the network.

4.1.6 Block Rewards

25 percent of the total coins will be periodically minted as block rewards to distribute to validators and delegators. Incentives play a big role in deciding the token allocation. For example, allocating insufficient amount of tokens to validators may lead to the extreme case where validators cheat the network by accepting fraudulent blocks (e.g double-spending), or validators may not be interested in participating the network which threats the network security. Allocating too little tokens to advisors may result in advisors being inactive, discouraging them from engaging with the team to provide helpful advice. Overall, we strategically allocate our token in line with our long-term vision with regard to the development and future of the project,

In the first *5 years* of Mainnet, a total of 250 million TAU Coins will be distributed for validators in every block. Apart from the block rewards from the network, validators also receive transaction fees (*gas*) from transaction creators. We assume that after 5 years of running TAU Network, the transaction fee from the network will be large enough to reward validators so there will be no need for block rewards to be minted anymore.

4.1.7 Token generation event

There are 2 *Token Generation Events* (TGE) that are corresponding to the 2 types of native currency in the network, the token and the coin. For TAU Token on BSC, the token generation is quite standard as the TAU team will mint and transfer tokens manually based on the specification in Table **??**.

TAU Token holders then can claim their coins on the TAU Mainnet by sending their tokens on BSC to the migration contract. These tokens can be burnt later on. The state of the vesting schedule at the time will also be replicated on TAU Mainnet.

4.1.8 Account Vesting

Vesting refers to the process of locking a certain amount of coins or tokens then gradually releasing them with time. Other than public distribution coins, the rest of the token

allocation categories are locked and vested on different terms.

In TAU Mainnet, locked Tokens from Team and Strategic partners can still be delegated for staking and voting for governance. However, tokens in the ecosystem growth and foundation reserves are not available for delegation.

4.1.9 Token release simulation

Figure 4.1.9 shows a simple simulation of TAU token release schedule.

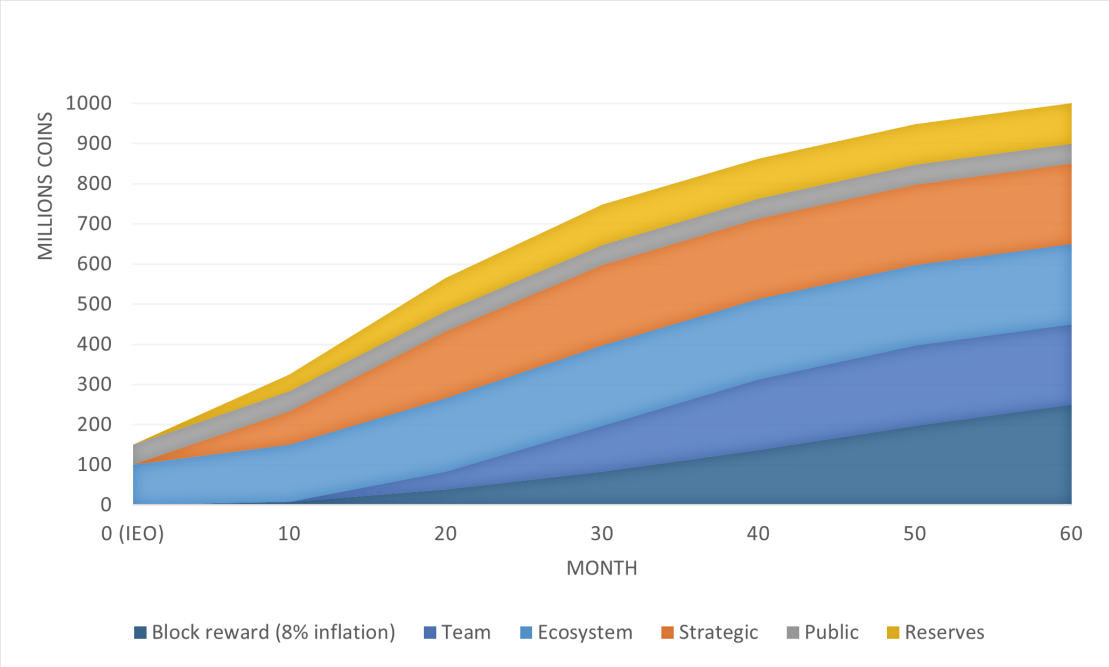


Figure 3: Simulation of tau release schedule

Assuming that 2/3 of the total TAU Coins in the whole network are staked, our simulation shows that with an average of 8% inflation per year, we can fully distribute all 250 millions to validators within 5 years (60 months).

5 Roadmap

TIMELINE 1: *TAU Network Roadmap*

2022-04 —— **Bootstrap & Private Fundraising** ——

1 Website launch

2 Mint and Invite DAPP Launch

2022-05 —— **Bootstrap & Private Fundraising** ——

1 Marketing promotion

2022-06 —— **Bootstrap & Private Fundraising** ——

1 NFT Whitelist

2 Mint Token Unlocked

3 PI network cross-chain test

2022-Q3 —— **Bootstrap & Private Fundraising** ——

1 NFT DAPP Launch

2 Online CMC

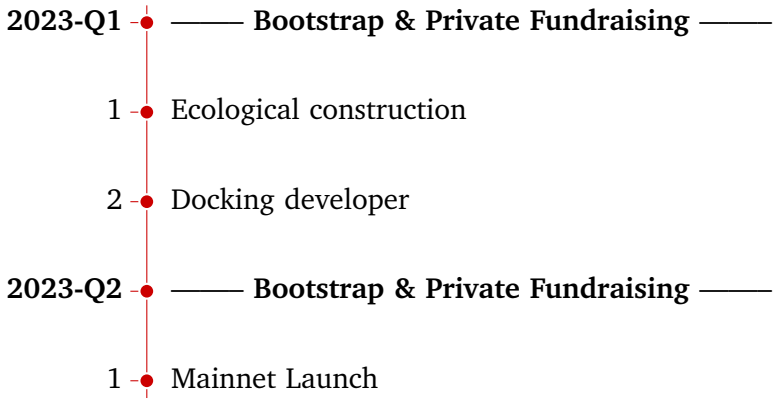
2022-Q4 —— **Bootstrap & Private Fundraising** ——

1 Launch Bonus TestNet

2 Launch Pi,BSC,ETH CrossChain

6 Roadmap

TIMELINE 2: *TAU Network Roadmap*



We presents the roadmap of the TAU Network project in the timeline drawing above. From 2022 to 2023, the project goes through 7 main phases.

References

[1] Ethan Buchman. *Tendermint: Byzantine fault tolerance in the age of blockchains*. PhD thesis, 2016.

[2] Jae Kwon and Ethan Buchman. Cosmos whitepaper, 2019.