Incentiv

White Paper

Updated 24th June 2024

Version 1.0

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Introduction

Incentiv is a Layer 1 blockchain with a core mission: making blockchain technology easy, accessible, intuitive, and rewarding. We believe that complex interfaces and technical jargon should not be barriers to participate in the blockchain space. Incentiv aims to bring the simplicity of web2 into the web3 realm, creating an intuitive user experience and environment where non-technical users can engage with blockchain technology and decentralized applications (dApps).

Incentiv recognizes the importance of a robust and sustainable ecosystem and strives to foster a collaborative environment where everyone on the network is rewarded for their contribution and engagement. This is achieved through a transparent and inclusive incentive model that motivates participation and drives the growth of the Incentiv ecosystem.

The Incentiv blockchain is more than just technological infrastructure; it is a community-driven ecosystem built on the principles of simplicity on one hand, and innovation on the other.

As Incentiv continues to develop and expand, it remains focused on its mission to democratize blockchain technology, making it a useful, secure, and indispensable part of everyday life for users around the globe. Through strategic innovations and a commitment to user-centric design, Incentiv is poised to lead the next wave of blockchain adoption, offering solutions that are not only technologically advanced but also socially impactful.

This document is the first version of the Incentiv white paper. It is subject to change and may be supplemented or clarified by additional details, information and documents based on ongoing research, studies, and feedback from our community, our advisors, and market leaders.

We are committed to transparency and iterative development, and we welcome input from all stakeholders to refine and enhance Incentiv and its solutions.

Architecture Overview

The Incentiv blockchain is a hybrid of traditional web technologies (web2) and blockchain innovations (web3), designed to combine the reliability and user-friendliness of web applications with the security and transparency of blockchain technology. Figure 1 provides a high-level overview of how various components within the Incentiv network work together to create a secure, efficient, and accessible blockchain ecosystem.

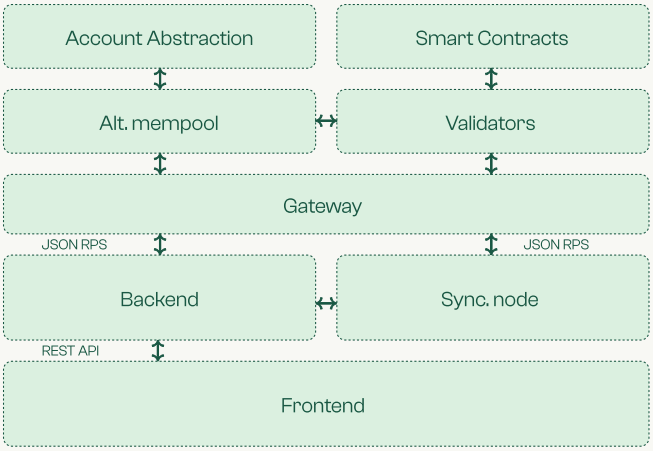

Figure 1 - Overview of Incentiv's Architecture

Components and Their Interactions

Smart Contracts: This component is the backbone of the Incentiv blockchain, hosting a variety of contracts that deliver core functionalities such as staking, governance, treasury, incentives distribution, DEX (decentralized exchange), payments, and name service. These contracts ensure that all blockchain operations are executed in a decentralized and trustless manner, allowing for transparent and fair interactions within the network.

Account Abstraction Contracts: Separate from the general smart contracts, the Account Abstraction contracts specifically facilitate a more flexible user account model, akin to ERC-4337. This abstraction layer simplifies interactions for users by allowing operations that typically require multiple steps to be executed in a single transaction, enhancing both user experience and system efficiency.

Alt. Mempool: Serving a crucial role in the account abstraction process, the Alt. Mempool manages and maintains abstraction requests. Bundlers operating within this pool wrap these requests and submit them as regular transactions, which are then processed by the validators. This mechanism ensures that the blockchain can efficiently handle high volumes of abstraction requests without compromising on speed or security.

Validators: Validators are critical in maintaining the integrity and security of the blockchain. They process not only standard transactions but also the bundled requests from the Alt. Mempool. By validating and adding these transactions to the blockchain, they uphold the network's consistency and reliability.

Gateway: The Gateway acts as a conduit between the blockchain's internal operations and its external interfaces, employing JSON RPCs for communication. It effectively bridges the complex processes handled by validators and the Alt. Mempool with the more accessible interfaces used by the Backend and Sync Node.

Sync Node: This component is tasked with caching the current state of smart contracts, thereby significantly speeding up query processes for the Backend. By providing quick access to up-to-date contract states, the Sync Node plays a pivotal role in ensuring that the Backend can perform its functions with high efficiency and minimal latency.

Backend: The Backend forms the operational core of the blockchain, managing intricate business logic, user management, and session control.It interacts seamlessly with the Frontend and Sync Node, fetching necessary data through JSON RPC and serving user requests promptly and securely.

Frontend: Serving as the direct interface for users, the Frontend is designed to be intuitive and engaging. It connects to the Backend via REST API, providing users with a seamless experience whether they are trading on the DEX, participating in governance, or managing their digital assets. This layer ensures that all interactions with the blockchain are user-friendly and accessible to a broad audience.

The subsequent subsections will dive deeper into each of the components described above, providing detailed insights into their specific functionalities, interactions, and the roles they play within the Incentiv ecosystem. This will provide a clearer understanding of how each component contributes to the blockchain's overall performance and enhanced user experience.

Incentiv Smart Contract

The Incentiv blockchain is powered by a number of smart contracts, each designed to manage specific functionalities crucial for the operation and governance of the network. These contracts interact seamlessly to support the decentralized nature of the blockchain while ensuring paramount security, transparency, and efficiency. Figure 2 below illustrates how these contracts are interconnected within the Incentiv ecosystem, highlighting their roles and interactions.

Staking and Delegation contract: Central to the Incentiv network is the Staking and Delegation contract, which underpins the DPoS (Delegated Proof of Stake) consensus mechanism. This contract allows users to back validators by delegating their stake, enhancing the security and operability of the network. continuously synchronized from this contract (point (1) in Figure 2). The amount of stake delegated to a validator directly influences their likelihood of validating a block. A significant portion of the gas fees collected by validators from validated blocks is redistributed to their delegators (point (2) in Figure 2), incentivizing active participation in the network's sustainability and robustness.

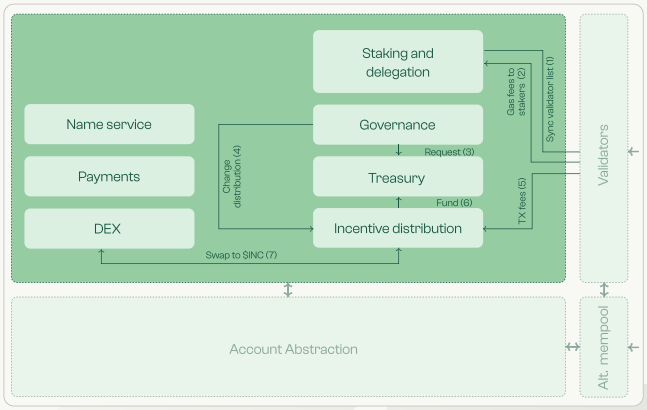

Figure 2 - Incentiv Smart Contracts

Governance Contract: The Governance contract is a pivotal component that empowers stakeholders to actively participate in decision-making processes that impact the development and configuration of the blockchain. It maintains records of current proposals and their voting statuses, executing approved actions such as releasing funds from the Treasury for blockchain development (point (3) in Figure 2), or adjusting the configuration of incentives distribution (point (4) in Figure 2).

Treasury Contract: The Treasury contract holds the Long Term Treasury Fund (LTTF), which are $INC tokens out of circulation allocated on TGE (Token Generation Event) and accumulated over time. The release and utilization of these tokens are contingent upon a resolution made in accordance with Incentiv Governance model and vote by the stakeholders. This ensures that financial allocations of the LTTF are aligned with the stakeholders' interest, strategic objectives and approval.

Incentives Distribution Contract: The Incentives Distribution contract manages the distribution of incentives generated from transaction fees (point (5) in Figure 2). The principles of the distribution may be adjusted via governance proposals upon community consensus (point (4) in Figure 2). Additionally, this contract funds the Treasury (point (6) in Figure 2), ensuring a sustainable financial model for ongoing operations and development of Incentiv, its community and its ecosystem.

DEX (Decentralized Exchange): The DEX comprises a series of contracts that facilitate liquidity provision by token issuers and token swapping by users. It is intricately linked with other blockchain functionalities; for instance, the Incentives Distribution contract utilizes the DEX to convert various token fees into Incentiv native token before distribution (point (7) in Figure 2). Similarly, the Payments Contract leverages the DEX to swap assets for payment executions (point (8) in Figure 2), enhancing the versatility and utility of transactional processes on the blockchain.

Payment Contract: The Payments contract facilitates functionalities such as scheduled payments and approved fund receptions, enhancing the financial transaction capabilities of the Incentiv blockchain.

Name Service Contract: The Name Service contract manages the ownership and assignment of system names, including domains or human-readable addresses. These names are utilized throughout the blockchain, integrating a layer of user-friendliness and accessibility into the blockchain environment.

In addition to the smart contracts mentioned above, the Incentiv blockchain also operates smart contracts that enable the Account Abstraction layer. These smart contracts will be detailed further in the subsequent subsection.

Account Abstraction

Incentiv employs a novel approach to user transactions through its Account Abstraction Layer, which adheres to the ERC-4337 standard for smart contract wallets. This subsection details the architecture and operational mechanics of account abstraction on the Incentiv blockchain. This system is uniquely designed to manage all user transactions exclusively through this layer, thereby enhancing user experience and flexibility. Figure 3 illustrates the workflow and interaction between various components of the account abstraction system within Incentiv.

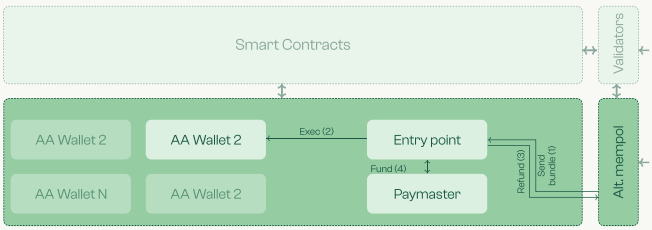

Figure 3 - Account Abstraction Interactions

Incentiv redefines transaction handling through its Account Abstraction Layer, embedding transaction logic within smart contract wallets. Unlike traditional blockchain models, all actions on Incentiv are processed through account abstraction. This approach streamlines transactions and integrates advanced features such as multi-token fee payments, fee collection, activity reporting, and scheduled payments directly from the user's wallet interface.

To initiate a transaction, a user submits a request to the Alt. Mempool. This request is prepared for bundling by "bundlers", who play a crucial role in converting the request into a regular transaction format and submitting it to the blockchain through the Entry Point contract:

1. **Entry Point contract (Send bundle)** Serving as the gateway for bundled transactions, the Entry Point contract receives bundled requests from bundlers (point (1) in Figure3). It acts as the primary receiver of these wrapped requests and directs them to the respective user's account abstraction wallet.

2 **Execution from AA Wallets (Exec.):** Upon receiving the instruction from the Entry Point contract, the user's account abstraction wallet executes the transaction (point (2) in Figure 3). Each wallet is equipped to handle complex logic, including the calculation and deduction of transaction fees in various token forms, as permitted by the blockchain.

3 **Refunding Gas (Refund):** After transaction execution, the wallet computes the gas used and facilitates a refund process back to the bundler through the Entry Point (point (3) in Figure 3). This ensures that bundlers are compensated for the gas costs incurred during the transaction processing.

4 **Paymaster (Fund):** In cases where users lack sufficient funds to cover transaction fees or choose not to pay directly, a Paymaster can finance the transaction (point (4) in Figure 3). The Paymaster evaluates the transaction request and funds the transaction costs upon approval, providing flexibility for sponsored transactions on the network.

By restricting all transactions to the account abstraction layer, the Incentiv blockchain ensures compliance with its rules. improves and enhances user experience. Attempted direct transactions on the network are automatically reverted, directing all activities through the vetted and secure abstraction process. This setup not only protects against unauthorized actions but also streamlines transaction processing for improved efficiency and user-friendliness.

All account abstraction requests are constructed and transmitted via the Incentiv Portal, which serves as the intuitive interface for interacting with the blockchain. This integration enables users to manage transactions easily and leverage the advanced capabilities of account abstraction without requiring deep technical knowledge. It is important to note that transaction origin isn't limited to the Incentiv Portal; any standard wallet can be used, provided it integrates the necessary logic to interact with bundlers.

The account abstraction process in the Incentiv network simplifies and secures transactions by employing a specialized system that channels all actions through a layered approach. This system is illustrated in the attached diagram, detailing the step-by-step flow of transactions within the network to ensure adherence to protocols and protect against unauthorized actions.

Figure 4 below providesan overview of of the transaction process on the Account Abstraction layers:

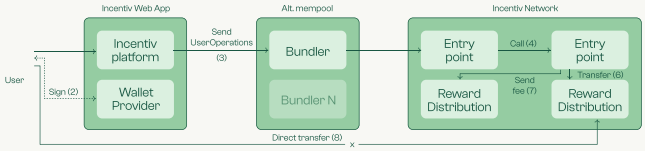

Figure 4 - Account Abstraction Transaction Process

1 **Inititiating a Transaction:** Users begin by initiating a transaction request through the Incentiv Web App, marking the first interaction with the blockchain to initiate a transaction.

2 **Signing the Transaction:** If using a third-party wallet provider such as Trust or MetaMask, users are prompted to sign the transaction. This step verifies the user's identity and intent.

3 **Generating UserOperations Payload:** Once signed, the transaction generates a UserOperations payload containing all necessary details formatted as required by the network. This payload is sent to the Alt. Mempool, where it awaits bundling. The Alt. Mempool prioritizes transactions based on various factors, including fee offerings.

4 **Bundling by Bundlers:** A bundler picks up the transaction from the Alt. Mempool, wraps it into a regular blockchain transaction, and submits it to the Entry Point contract.

5 **Processing by Entry Point Contract:** The Entry Point contract validates the transaction and forwards it to the respective user's Account Abstraction (AA) Wallet.

6 **Execution by AA Wallet:** The user's AA Wallet executes the transaction, transferring funds or executing other operations as intended.

7 **Fee Handling:** After execution, the AA Wallet sends the transaction fee to the Reward Distribution contract, which manages the distribution of fees within the network.

8 **Rejection of direct transfers:** Any attempts by users to bypass this process and send transactions directly to recipients are automatically rejected, maintaining the integrity and security of the transaction process.

This structured approach not only streamlines transactions but also integrates security directly into the operational workflow of the network. The account abstraction layer, based on ERC-4337, serves as the foundation for handling all network transactions, ensuring a consistent and secure method for transaction processing. This encompasses the bundling process in the Alt. Mempool, compensation mechanisms for bundlers, potential fee sponsorship, and interactions facilitated through the Entry Point contract.

In addition to these core functionalities, the Incentiv network incorporates several features aimed at enhancing its functionality and improving user experience. The AA Wallet Factory automates the creation of Account Abstraction Wallets, ensuring that all user wallets adhere to network standards and maintain uniformity. Furthermore, AA Wallets are configured to collect a percentage-based fee on $INC and token transfers, providing a reliable and steady revenue stream to support the network's operations.

Backend Architecture

The backend architecture of Incentiv is designed to support efficient, scalable, and secure operations by integrating various specialized modules that manage different aspects of the blockchain's functionality. This setup ensures that the blockchain remains responsive and capable of handling high volumes of user interactions and data requests. Figure 5 below outlines the structure and interaction of these backend components.

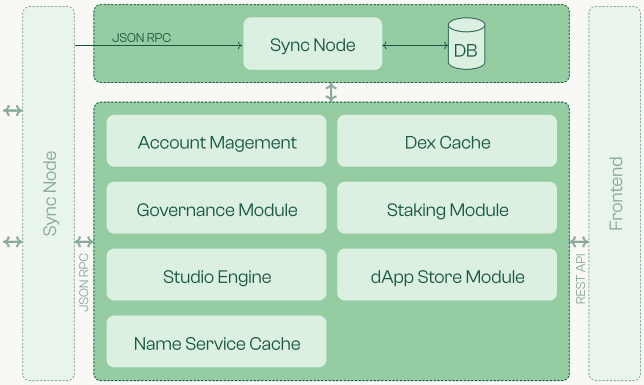

Figure 5 - Backend Architecture

Sync Node: At the core of the backend architecture is the Sync Node, crucial for maintaining an up-to-date state of the blockchain's smart contracts. This node pulls data from the blockchain and stores it in the Portal's backend database, enabling fast and efficient querying of on-chain data. By offloading the data querying process to a dedicated database, the Sync Node significantly reduces the resources needed for live data retrieval, thereby enhancing overall system performance.

Management: The AccountManagement module oversees all aspects of user accounts within the blockchain. It handles critical data such as user settings and the assignment of human-readable addresses, ensuring secure management and easy accessibility of user account information for a seamless user experience.

DEX Cache: To optimize decentralized exchange operations, the DEX Cache module stores essential DEX data like pricing, liquidity, and transaction volumes.This caching mechanism ensures rapid access to accurateDEX information, crucial for users engaged in trading and other financial activities on the blockchain.

Module: The Governance Module tracks current and historical governance proposals and monitors the progress of active voting. It syncs with the Governance contract through the Sync Node and stores proposal data in a database, enabling users to quickly search and filter through proposals, thereby improving user engagement in the blockchain's decision-making processes.

Staking Module: Similar to the Governance Module, the Staking Module maintains a cached state of the Staking and Delegation contract. This setup facilitates quick access to staking data, supporting efficient management and analysis of staking activities across the blockchain.

Studio Engine: Incentiv Studio tackles the challenge of complex dApp development by providing a low-code/no-code interface. This interface utilizes drag-and-drop functionality and a library of predefined templates. These pre-built components act as building blocks, allowing developers of all experience levels to assemble and customize dApps efficiently. The Studio Engine supports the development environment within the Incentiv portal, providing backend infrastructure for the Studio. It processes and deploys requests from users creating decentralized applications (dApps) or other blockchain-based projects, ensuring robust support for developers.

dApp Store Module: Responsible for managing listings, ratings, and details of dApps available in the Incentiv dApp Store, this module ensures regular updates and maintenance. It offers users access to a diverse range of applications and tools through the dApp Store interface.

Name Service Cache: Facilitating quick lookups of human-readable addresses and domains, the Name Service Cache synchronizes with the Name Service contract. This caching service accelerates the resolution process, enhancing the efficiency of transactions and interactions involving human-readable identifiers.

Technical Specifications

This section provides comprehensive implementation details of the Incentiv blockchain, covering essential aspects from protocols and consensus mechanisms to specific functionalities such as account abstraction and smart contracts. Structured to offer clear insights into the seamless integration of system components, it ensures transparency in operations including fee reporting, reward distribution, and the configuration of both backend and frontend architectures.

The technical foundations and operational mechanics detailed in this section serve to enlighten stakeholders, developers, and technical analysts about the robustness, scalability, and security measures of Incentiv. It underscores the blockchain's dedication to efficiency and innovation in blockchain technology, bolstering its suitability for a dynamic digital economy. The subsequent subsections will delve deeper into key blockchain components, presenting detailed technical implementation specifics.

Protocol

The Incentiv network operates as an EVM-compatible DPoS (Delegated Proof of Stake) network, enabling seamless integration with existing Ethereum-based tools and systems while leveraging the efficiency and governance model of DPoS. A distinguishing feature of the Incentiv network is its exclusive transaction handling process. Unlike traditional networks, Incentiv only accepts transactions routed through the account abstraction layer, enhancing security and operational efficiency.

At the core of this system, only specific types of transactions are permitted:

- **Interactions with the Entry Point Contract:** This allows bundlers to submit user requests as transactions to the blockchain. The Entry Point Contract acts as the gateway for all bundled transactions, ensuring proper formatting and authorization before execution.

- **Validator Transactions:** Validators, pivotal to the network, can directly send gas fees to the Staking and Distribution contract. This process is crucial for compensating stakeholders and maintaining economic balance within the network.

Additionally, the protocol includes a fundamental mechanism for user fund management. Users can transfer native coins ($INC) directly to the Entry Point Contract, which then forwards them to the user's account abstracted wallet. This feature ensures a liquidity path for users with funds in regular wallets, preventing funds from becoming inaccessible within the blockchain.

This protocol design not only upholds the operational integrity and security of the Incentiv Network but also aligns with its strategic goal of offering a robust, user-centric blockchain environment. Further details on consensus mechanisms, account abstraction, and other integral components will be discussed in their respective subsections, contributing to a comprehensive understanding of the Incentiv architecture. These aspects remain subject to refinement based on ongoing research and development efforts.

Consesnus Engine

The Incentiv network operates as an EVM-compatible platform governed by a Delegated Proof of Stake (DPoS)consensus mechanism. In this model, stakers have the ability to delegate block production (minting)to validators by staking coins with them, thereby increasing the validator's probability of producing a new block. When a validator successfully mints a new block, the rewards are distributed proportionally among the stakers who have delegated their stake to that validator.

This system incentivizes good behavior among validators, as any misconduct results in penalties that affect both the validator and their associated stakers. Such penalties compel stakers to carefully select reputable validators, as failure to do so risks financial losses.

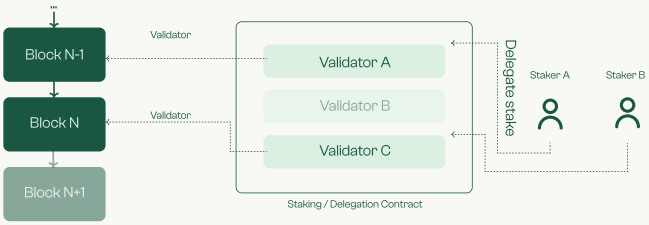

Figure 6 - Staking and Delegation

Delegating Block Validation Process:

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1. **Stakers Deposit Coins:** Stakers begin by depositing an arbitrary amount of coins into a designated contract.

2. **Allocation to Validators:** After depositing coins, stakers allocate their deposited amount to a preferred validator. The allocation determines the validator's chances of producing the next block. Validators with higher amounts of coins allocated to them have increased probabilities of block production.

3. **Validator List Management:** To maintain a concise and reliable list of active validators, there is a maximum limit on the number of validators that can be active concurrently. This list is dynamically sorted based on the total amount of coins allocated to each validator

4. **Block Production Opportunity:** Validators included in the active list have opportunities to produce new blocks based on their coin allocations. Validators not included in this list have zero chances of block production, resulting in no returns for stakers who allocated coins to them.

Maintaining the Validator List and Order

Validators continuously fetch the current list of active validators from the smart contract, along side the amount of allocated coin for each validator. Validators will then use this information to compute the address of the validator that will mint the next block.

While the next validator must be chosen randomly, the probability must be equivalent to the relatives take allocated to that validator. To implement this, validators must first generate a random number. The generated value must be random and uniform, but also the same for each validator. To do so, the random number is generated as:

(1) R = Keccak256 (BLOCK_NUMBER++ FAIL_COUNT) mod TOTAL_STAKED

In equation (1), BLOCK_NUMBER is the next block number, FAIL_COUNT is the total number of validation failures, mod is the modulo operator, and the operator ++ represents string concatenation. The field TOTAL_STAKED represents the sum of all coins for each of the current active validators, as shown below.

$$\text{(2) TOTAL\_STAKED} = \sum_{I}^{V_{COUNT}} \text{STAKED\_AMOUNT}[I]$$

This implies that given an identical list of validators, validator staked amounts, block number and failure count, every validator will come up with the same value for *R*. The next challenge is to select a validator based on *R*. To do so, Incentiv sorts the validators based on their addresses and line up their staked amounts one after another. The validator on which *R* falls is the next block validator.

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To better understand the mechanism, please see an example in Figure 7 below, where validators A, B, C, and D have stake allocations of 5, 10, 5, and 15 tokens respectively. Assuming that the validators are sorted by address, a value of *R* in [0, 5) selects Validator A, a value of *R* in [5, 15) selects Validator B, a value of *R* in [15, 20)selects Validator C and, a value of *R* in [20, 35) selects Validator D. Since the value of *R* is 17, as shown in the example, it falls within the range assigned to Validator C.

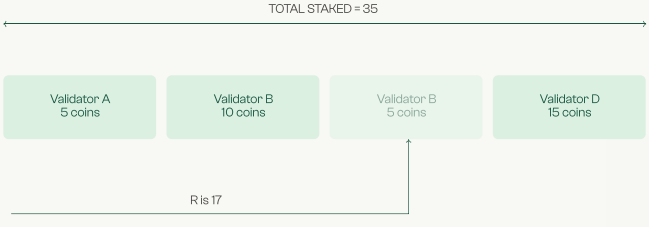


Figure 7 - Validator Selection

This mechanism ensures that the likelihood of a validator being selected is directly tied to the amount of stake allocated to them, maintaining fairness and consistency across the network. Validators will unanimously agree on the next validator, provided they have access to the most recent list of validators and their corresponding staked amounts.

Validator Misconduct and Penalties

In Incentiv's consensus system, maintaining a trustworthy network is paramount. To uphold integrity and incentivize responsible and good conduct , the protocol penalizes validators for misconduct, such as double signing or failing to validate blocks accurately and promptly.

While the next validator must be chosen randomly, the probability must be equivalent to the relatives take allocated to that validator. To implement this, validators must first generate a random number. The generated value must be random and uniform, but also the same for each validator. To do so, the random number is generated as:

Penalty Structure

- If a validator is found guilty of misconduct, they will forfeit 50% of their staked coins.
- Of the penalized stake, 5% is allocated to validators who report the misconduct, acknowledging their contribution to upholding network integrity.
- The remaining 45% is transferred to the network's treasury.

Misconduct Detection and Reporting

- Validators actively monitor each other for signs of misconduct. If a validator suspects wrongdoing, they can initiate a reporting procedure by submitting evidence to the network.
- The network subsequently verifies the evidence through a predefined consensus process. If the evidence is substantiated, penalties are promptly applied according to the established protocol.

This penalty mechanism serves a dual purpose: it discourages malicious behavior among validators and encourages active participation in governance and oversight. This approach ultimately enhances overall network security and promotes a trustworthy ecosystem for all participants.

When misconduct is reported, it triggers an increment in the FAIL_COUNT counter within our network. This counter plays a critical role in our consensus mechanism by influencing the random number generation used to select the next validator. Specifically, the FAIL_COUNT is combined with the BLOCK_NUMBER in a hash function (Keccak256), ensuring that each reported instance of misconduct subtly adjusts the outcome of the random number generation.

As a result, this adjustment affects the validator selection process, potentially leading to a different validator being chosen to mint the next block. This mechanism ensures that the consequences of misconduct reverberate throughout the network, fostering a self-correcting system where validator reliability directly impacts their likelihood of selection. It incentivizes validators to uphold high standards of behavior, thereby enhancing the overall security and reliability of the network.

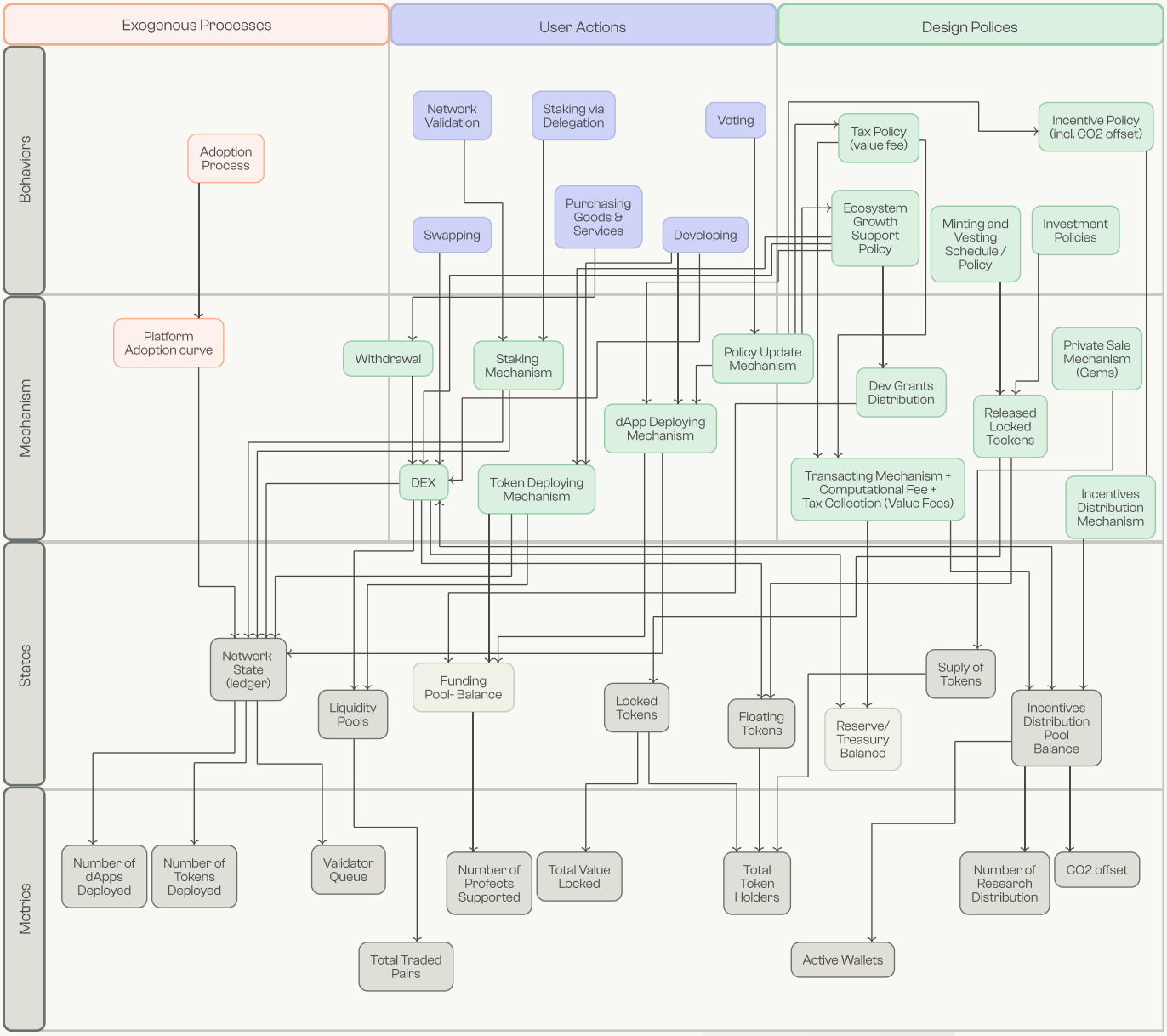
Incentives Distribution

The Incentives Distribution mechanism within the Incentiv blockchain is integral to maintaining a balanced and incentivized ecosystem. This system ensures that the fees collected from user transactions, AA wallets, and dApp operations are distributed fairly among stakeholders who contribute to the network's activity and health.

Incentiv's economic model redistributes incentives to six key stakeholder groups proportionally based on their participation and contributions to the ecosystem:

- **Active Wallets / Users**
  - Users who actively participate in the network by holding tokens, making transactions, and interacting with dApps
  - Incentivized for their engagement and contribution to the platform's overall activity and growth (see below the incentive calculation)
- **Token Developers**
  - Creators of new tokens on the Incentiv platform.
  - Incentivized for their role in expanding the ecosystem and driving token adoption.
- **dApp Developers**
  - Builders of decentralized applications (dApps) on the Incentiv network.
  - Incentivized for creating innovative applications that attract users and generate value within the ecosystem.
- **Wallet Developers**
  - Creators of wallets and tools that enable users to securely store, manage, and interact with their tokens on the Incentiv network
  - Incentivized for their contribution to enhancing user experience, security, and accessibility within the ecosystem, offered a business model for the first time in blockchain history
- **Network Operations**
  - Validators and Bundlers that operate the infrastructure underlying the Incentiv network.
  - Incentivized for their contribution to maintaining a secure, decentralized, and efficient blockchain infrastructure.
- **CO2 Offset**
  - A portion of the incentives is allocated to offset the carbon footprint of the Incentiv network.
  - This allocation supports environmental sustainability initiatives and reduces the net environmental impact and footprint of the network and ecosystem.

By distributing incentives proportionally to these stakeholders based on their level of participation and value creation, Incentiv's economic model ensures a fair and inclusive ecosystem that incentivizes active engagement and collaboration. governance and oversight. This approach ultimately enhances overall network security and promotes a trustworthy ecosystem for all participants.



Incentive Calcutlation

The formula to determinea user's incentives (R_U) based on their activity points (A_U) and the total activity points (A_T) accumulated during an epoch is as follows:

$$R_U = R_T \times \frac{A_U}{A_T}$$

Where *R* is the total incentives allocated for distribution in that epoch.

This calculation ensures that incentives are proportionally distributed based on user engagement.

Integration with ERC-1973

To facilitate real-time incentive distribution based on user activity, the Incentiv blockchain integrates ERC-1973 standards, utilizing round masks and user masks for each epoch. This setup enables the dynamic calculation and updating of incentives as users actively engage with the blockchain. Here's a step-by-step outline of how the system tracks user incentives:

1

Incentives received on the Incentives Distribution contract

In this case, the received rewards RNEW is distributed amongst users based on each user's activity points. To do so, the network maintains a round mask for the epoch MR as follows:

$$M_R := M_R + \frac{R_{NEW}}{A_T}$$

2

Computing unclaimed incentives for a user

To compute the epoch incentives (RU) for a specific user on the Incentiv blockchain, there is a need to utilize their activity pointsfor the epoch (AU) and their user mask for the epoch (MU), into the following formula:

$$R_U := (M_R + M_U) \times A_U$$

Once R_U is computed and stored, user's mask is reseted as follows:

$$M_U := M_R$$

This ensures that the next R_U calculation will be 0, unless there has been a new incentive distribution onto the Reward Distribution contract.

3

Updating user activity points .

In case new activity of an existing user is reported (ANEW), the states are updated as follows:

- If the epoch has changed since the last user activity update - close epoch (point 4 below)
- Compute and cache unclaimed rewards for the user (point 2 above)
- Update the user activity (A_U) and total activity (A_T)

To update user activity (A_U) and total activity (A_T), we simply compute the following:

$$A_U := A_U + A_{NEW} \qquad A_T := A_T + A_{NEW}$$

This ensures that the next active user's reward distribution will take into account the new user activity.

4

Closing previous epoch

When a user's last reported activity was on a previous epoch, it is required to make sure that all the rewards of that epoch are transferred to the user before reporting the new epoch activity.To do so, the contract first checks if the user's last active epoch equals the current epoch. If not, it simply computes the unclaimed rewards for that epoch and sets the last active epoch as the current epoch. This is described in more detail in the pseudocode section

Pseudocode for Real-Time Reward Updates

The pseudocode for each of the relevant activities under the Reward Distribution contract is based on acting tracking of data, user states and global state, as follows:

UserData: Stores user-specific information, including:

- **unclaimedRewards:** Accumulated rewards that the user has not yet claimed.
- **lastActiveEpoch:** The last epoch during which the user was active.

- **epochData:** Contains per-epoch data:
  - **activityPoints:** Points accumulated by the user during the epoch due to their activities (A_U).
  - **userMask:** Tracks the last known state of the round mask when the user last updated their activity points (M_U).

GlobalData: Stores information relevant to all users and the system

- **epochData:** Contains data for each epoch:
  - **roundMask:** A cumulative measure that increases as rewards are distributed and is used to calculate individual rewards (M_R).
  - **totalActivityPoints:** Total points accumulated by all users during the epoch (A_T).

Rewards Received: When new rewards are distributed to the system, the round mask for the current epoch is updated based on the amount of new rewards and the total activity points accumulated in that epoch. This update ensures that the reward per activity point is adjusted to include the newly received rewards.

```
Function distributeRewards
Input: newRewards

epoch = getCurrentEpoch()

// Calculate the increment to the round mask
based on new rewards divided by total

activity points
GlobalData.epochData[epoch].roundMask +=
        newRewards /
        GlobalData.epochData[epoch].totalAct
        ivityPoints
```

NewActivity Reported: When a user reports new activity, several steps occur:

- Update of user's activity points and the global total activity points for the current epoch.
- Calculation of the rewards due to the user since their last update, using the difference between the current round mask and the user's last recorded user mask.
- Update of user's unclaimed rewards with the newly calculated amount.
- Set the user's mask to the current round mask to mark the latest update point.

```
Function updateUserActivity
Input: user, newActivityPoints

epoch = getCurrentEpoch()

// Check for unfinalized rewards from the
previous active epoch
IF UserData[user].lastActiveEpoch ≠ epoch
THEN
   closeUserEpoch(user)

// Update the total and user-specific
activity points
UserData[user].epochData[epoch].activityPoin
ts += newActivityPoints
GlobalData.epochData[epoch].totalActivityPoi
nts += newActivityPoints

// Calculate unclaimed rewards based on the
updated round and user mask
UserData[user].unclaimed +=
  (GlobalData.epochData[epoch].roundMask -
  UserData[user].epochData[epoch].userMask)
*
UserData[user].epochData[epoch].activityPoin
ts

// Update the user mask to the current round
mask
UserData[user].epochData[epoch].userMask =
  GlobalData.epochData[epoch].roundMask
```

Handling Unfinalized Epoch Calculations: Before logging new activity, the system checks if there's an unfinalized reward calculation from the last active epoch:

- If the user's last active epoch is not the current one, calculate the unclaimed rewards for the last active epoch using the same method as for the new activity.
- Update the user's record to reflect the final state of the last active epoch and move their active epoch to the current one.

```
Function closeUserEpoch
Input: user

epoch = getCurrentEpoch()

IF UserData[user].lastActiveEpoch ≠ epoch
THEN:
    lastActiveEpoch =
    UserData[user].lastActiveEpoch

    // Calculate the unclaimed rewards using
    the difference in the round mask since
    the user's last update
    UserData[user].unclaimed +=
       (GlobalData.epochData[lastActiveEpoch
       ].roundMask -
       UserData[user].epochData[lastActiveEp
       och].userMask) *
       UserData[user].epochData[lastActiveEp
       och].activityPoints

    // Reset the user's mask to the current
    round mask for the closed epoch
    UserData[user].epochData[lastActiveEpoch
    ].userMask =
       GlobalData.epochData[lastActiveEpoch]
       .roundMask

    // Update the user's record to the
    current epoch, indicating a new active
    period
    UserData[user].lastActiveEpoch = epoch
```

Roadmap and Future Developments

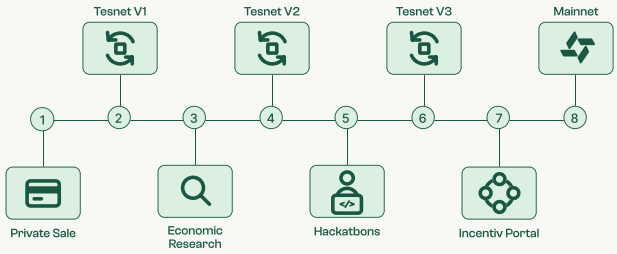


Figure 9 - Incentiv Roadmap

Tesnet V1

The purpose of running the Incentiv testnet is to research the reward mechanism and user behavior. This testnet is a fork of the Binance Application Sidechain (BAS), and features the same Proof of Stake Authority (PoSA) consensus mechanism. This approach allows for a more controlled testing environment for the testing period.

In addition, the economic model of this version features the rewards, but instead of a protocol DEX, value fees are collected in the token transacted, and are later on auctioned for INC tokens for distribution

During this phase, participants have the ability to:

- Get $INC tokens as rewards from the faucetto experiment and explore
- Transfer tokens
- Create new tokens via the token generation tool or standard deployment
- Deploy Smart Contracts
- Place bids in the ongoing token auctions or deploy bots to do the bidding for them
- Claim rewards based on the traffic generated in the blockchain (bots included)

Testnet V2

After the first public testnet, Incentiv team will conduct a thorough analysis and then re-deploy an entirely new version of the testnet where we will implement all the learnings gathered. Testnetv2 will provide a fully operational environment that integrates the core developments. This testnet will include the deployment of the client compatible with EVM, account abstraction contracts, and the advanced features of AA wallets. The platform will undergo rigorous integration testing to ensure that all components work seamlessly together. This includes testing native coin and token fee implementations on transfers, as well as the functionality of scheduled payments within the AA wallets.

Testnet V3

A third testnet fully equipped with the DPoS consensus mechanism, providing a robust platform for rigorous testing and refinement. This testnet will demonstrate the effectiveness of the Staking and Delegation contract, ensure the dynamic validator list accurately updates and manages validators based on staking, and confirm the fairness and reliability of the validator selection mechanism.

Incentiv Portal

A fully functional Incentiv Portal, serving as the central user interface for the Incentiv blockchain. This portal will integrate essential features such as user registration through both third-party wallet providers and the platform's own provider. It will also introduce a new mnemonic standard to enhance wallet security and usability, along side the option for cloud mnemonic backups to ensure safe storage of recovery phrases.Additional functionalities will include comprehensive blockchain monitoring capabilities for reading balances and contract states, and the facilitation of transactions via account abstraction for straightforward contract interactions.

Conclusion

Incentiv aims to simplify and democratize blockchain technology, making it more accessible and rewarding for market participants, from users to developers.

By combining the user-friendly aspects of web2 with the transparency and security of web3, we provide an intuitive platform for non-technical users to engage with blockchain technology and decentralized applications. Our focus on fostering an inclusive and collaborative ecosystem ensures that all participants are fairly rewarded for their contributions.

Through our commitment to simplicity and user-centric design, we hope to play a part in making blockchain technology a useful and integral part of everyday life for people around the world.

As Incentiv continues to innovate and expand, it remains stead fast in its mission to democratize blockchain technology. By prioritizing user-centric design and strategic innovations, Incentiv is poised to lead the next wave of blockchain adoption, offering solutions that are not only technologically advanced but also socially impactful.

Incentiv stands at the forefront of blockchain technology, providing a blockchain that is not just a technological infrastructure but a vibrant, community-driven ecosystem. With a clear focus on inclusivity, simplicity, and sustainability, Incentiv is set to make blockchain an indispensable part of everyday life for users around the globe.

Legal Disclaimers

Incentiv Reward Distribution

This white paper introduces Incentiv, a blockchain designed to address key challenges in the current blockchain ecosystem. The first version of our white paper aims to present the concept, identify the challenges we are tackling, and propose the solutions we are exploring, researching and building.

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