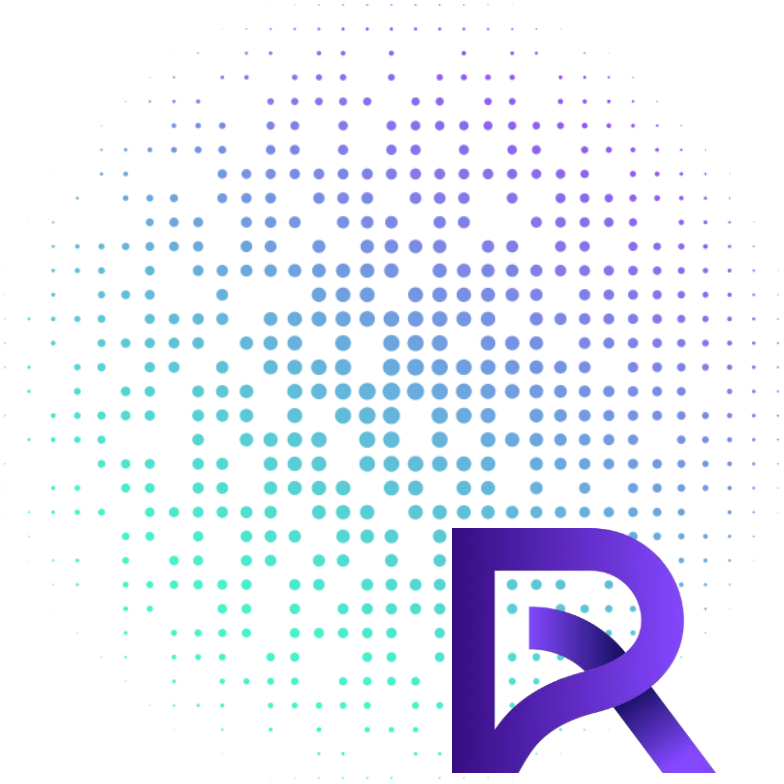

RYSEN

WHITE PAPER V1.0

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01 INTRODUCTION

The emergence of blockchain technology has become a significant global phenomenon that has shaken the current technology paradigm. Additionally, there is a growing interest in cryptocurrencies used to maintain the blockchain, including Ethereum (ETH), Cardano (ADA), Solana (SOL), Tron (TRON), and Neo (NED), among other mainnet coins. Ethereum, in particular, has the most DApps and is the foundation for recent major projects such as DeFi and NFT.

However, despite its successes, Ethereum still faces significant problems. Here are some of the major issues with the Ethereum mainnet:

- Scalability: As the demand for DApps and decentralized finance (DeFi) solutions on Ethereum increases, the network becomes congested, causing delays and increased transaction fees.
- Gas fees: Gas fees are fees charged for executing transactions and smart contracts on the Ethereum network. These fees can be high and volatile, making it difficult for developers to predict the cost of deploying their applications on the network. This can be a significant barrier to entry for new developers and smaller projects.
- Centralization: Ethereum is becoming increasingly centralized, with a few large mining pools controlling a significant portion of the network's computing power. This poses a risk to the network's security and decentralization.
- Environmental impact: The Ethereum mainnet, like many other blockchain protocols, relies on a proof-of-work consensus mechanism that requires a lot of energy to operate. This results in a significant carbon footprint and environmental impact.
- Upgradeability: Ethereum mainnet's upgradeability is a double-edged sword. While it allows for regular updates and improvements to the protocol, it also poses a risk of breaking backward compatibility and causing issues for DApps and smart contracts built on previous versions of the protocol.

Overall, these problems present challenges for the adoption and long-term sustainability of Ethereum mainnet. However, the Ethereum community is actively working on solutions, such as the move to a proof-of-stake consensus mechanism, to address these issues and improve the platform's scalability, security, and sustainability.

01 INTRODUCTION

RYSEN is a blockchain protocol that provides several advantages over other blockchain networks, including scalability, low fees, true decentralization, environmental sustainability, and upgradeability. Here is a more detailed explanation of how RYSEN excels in each of these areas:

- Scalability: RYSEN is designed to handle a high volume of transactions, making it highly scalable. Its architecture allows it to process thousands of transactions per second, which is essential for handling large-scale applications, such as decentralized finance (DeFi) and Non-Fungible Token (NFT) marketplaces.
- Low Gas Fees: RYSEN has low transaction fees, which is essential for the adoption of blockchain applications. Low transaction fees make it easier for developers to build and deploy applications on the network, and it ensures that users can access and use these applications at a low cost.
- True Decentralization: RYSEN is highly decentralized, with a consensus mechanism that distributes mining power among many nodes. This ensures that no single entity has control over the network, which enhances its security and resistance to attacks. Additionally, RYSEN's governance structure ensures that decisions are made democratically, which further enhances its decentralization.
- Environmental Sustainability: RYSEN uses a delegated randomized proof-of-stake (DRPOS) consensus mechanism, which is much more environmentally sustainable than proof-of-work mechanisms used by many other blockchain networks, including Ethereum. DRPOS requires less energy consumption, which reduces its carbon footprint and makes it more sustainable in the long term.
- Upgradeability: RYSEN has a modular architecture that allows for easy upgrades and improvements without breaking backward compatibility. This makes it easier for developers to implement new features and enhancements while ensuring that existing applications and data remain intact.

Overall, RYSEN's scalability, low gas fees, true decentralization, environmental sustainability, and upgradeability make it a highly attractive blockchain protocol for developers looking to build innovative and sustainable applications. With its robust features, RYSEN has the potential to revolutionize the blockchain industry and provide a more scalable, secure, and sustainable platform for decentralized applications.

02 MARKET STATUS

2.1 What is Mainnet?

Recently, the term 'Mainnet' has become a frequently used term in the context of blockchain. Companies that develop or release blockchain platforms often make announcements about the opening of their Mainnet. What exactly is a Mainnet, and why do companies compete to develop and announce it?

Mainnet refers to the creation of an independent ecosystem that provides the basis for creating other DApps and digital currencies through the operation of a blockchain network system. DApp (Decentralized Application) refers to a decentralized application, just like the apps we use on our smartphones. Coins such as Ethereum, Binance, Solana, Ripple, and Neo act as platforms just like smartphones.

To understand the mainnet, it is important to distinguish between coins and tokens. Coins are created when a protocol has its own mainnet, while tokens can be derived from and evolve into coins on different platforms. For example, EOS, which was developed based on Ethereum in 2017, opened its own mainnet in June 2018 and evolved from a token to a coin. This allowed the creation of other DApps and the formation of an independent ecosystem.

Creating a mainnet usually involves creating a token based on an existing coin (such as Ethereum) and conducting an initial coin offering (ICO). After that, a testnet is operated to verify if it can be built into an independent platform. The duration of this process may vary depending on the time it takes to handle complex tasks, such as wallet creation and exchange integration. Once the testnet is successful, the mainnet is finally released. The mainnet includes ecosystem development, coin wallet creation, and not only exchanges and peer-to-peer wallet transactions. After going through this process, the token becomes a coin with its own mainnet.

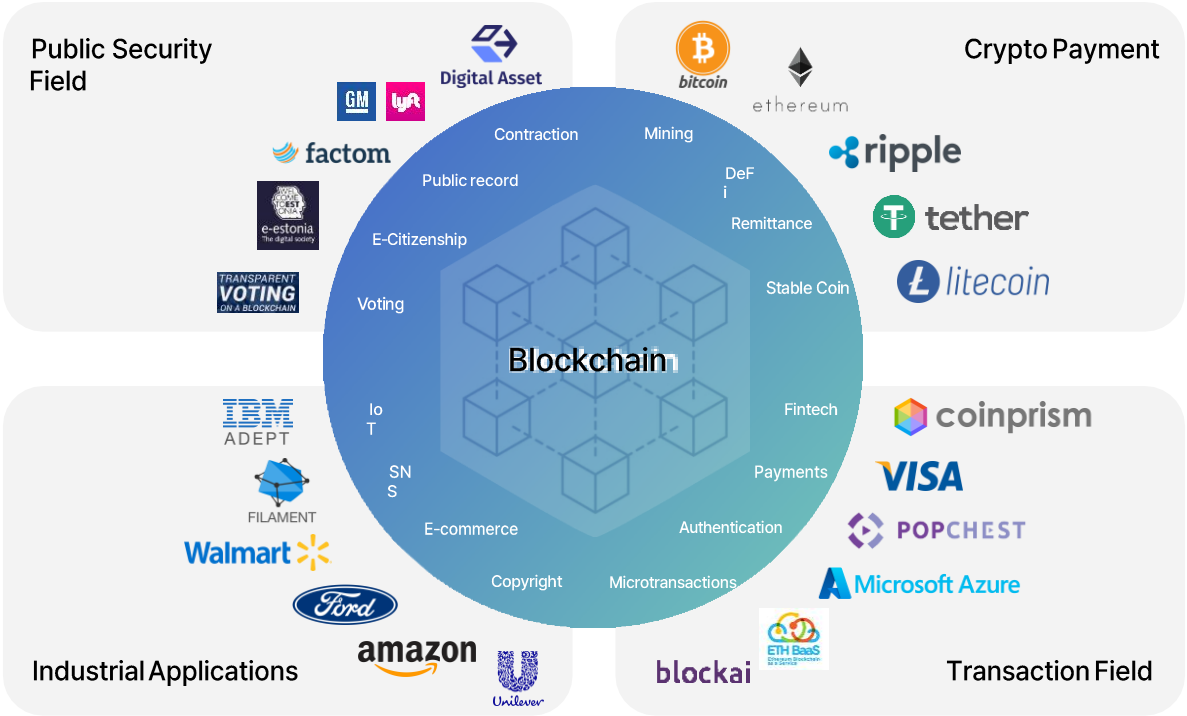
Having a mainnet is difficult, but it is a way for technology to be recognized. Large global exchanges also select whether to build a mainnet as one of the criteria for listing. However, caution is required when blockchain companies that run the mainnet based on Bitcoin or Ethereum without technical differentiation indiscriminately exaggerate and promote the mainnet.

2.2 Application of Blockchain Technology by Industry

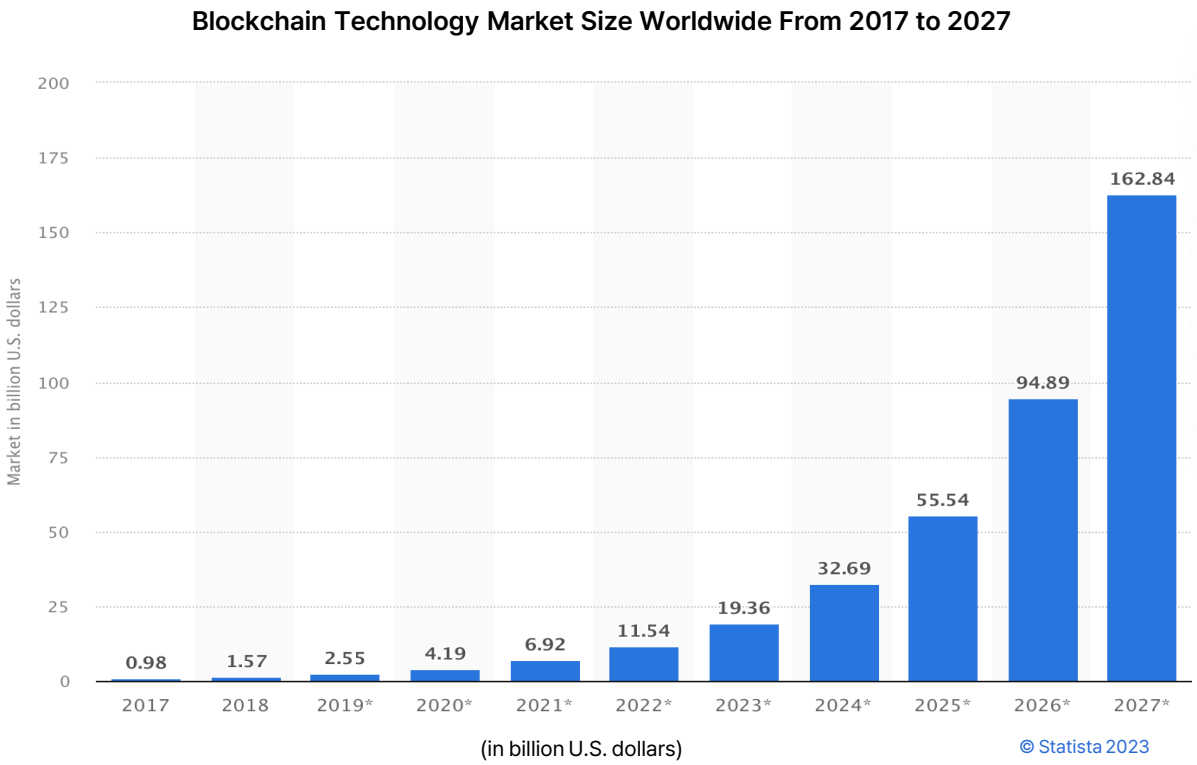
Blockchain technology has emerged as a key technology that supports the transformation of the internet from information internet to asset internet. As a result, various industries have begun to recognize the importance of blockchain technology as companies strive to establish standards and dominate the market.

According to the Harvard Business Review, blockchain technology has a high potential to transform businesses in the next 10 years, more so than big data or artificial intelligence. It is expected that around 65% of banks will implement blockchain solutions in the coming years, and forcasted as the technology to explode across various business environments.

Blockchain's application in different industries includes verifying the existence, transactions, and movement of cryptocurrency, sharing transaction facts, ensuring platform stability, providing identity verification and prevention of hacking and tampering in public/security sectors, proving ownership and transfer, guaranteeing multi-party information sharing and transparency in industrial applications, and introducing smart contracts to simplify processes and enable verification and sharing of identities and transactions in transaction/payment fields.



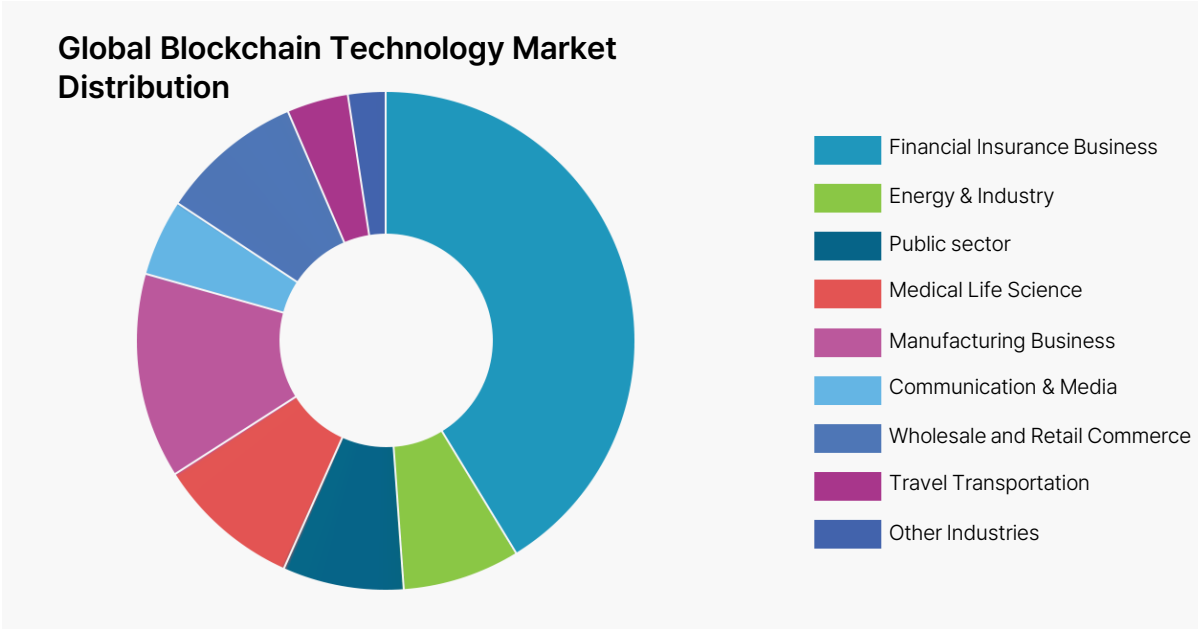
2.3 Growth Rate of Blockchain Market



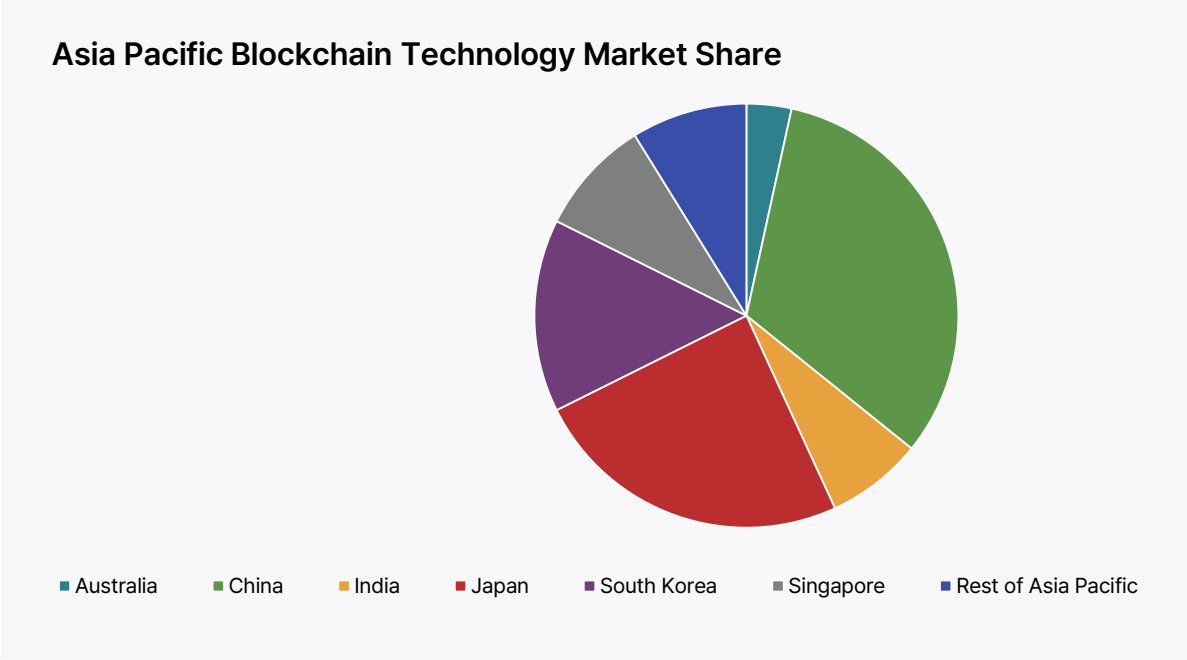
- Statista predicts the blockchain market size to potentially reach $163 billion by 2027. In 2017, the market size was just $0.98 billion.
- The total spending on blockchain solutions is expected to grow beyond $16 billion by 2023.
- The blockchain-as-a-service market alone is projected to reach a valuation of $24.94 billion by 2027.
- Blockchain technology has the potential to disrupt finance, data storage and exchange, security, digital identity, and many other sectors.
- Major financial institutions and technology companies, such as Deutsche Bank, JP Morgan, Microsoft, IBM, Wells Fargo, Alibaba, and many others have either invested in blockchain companies, working on their own blockchain infrastructure, or practicing both.

The blockchain has the potential to transform many other industries. This is why companies of all sizes are investing in blockchain technology and developing their own blockchain solutions. The rapid adoption of blockchain across industries is expected to be a major driving force in the blockchain market, which is projected to reach $163 billion over the next seven years.

Linkedin Article by Lon Wong, March 18, 2021



The Asia-Pacific region is a major player in the blockchain market, with many countries, such as South Korea, Japan, Australia, Singapore, and India, adopting and investing in blockchain technology to improve various industries, such as finance, healthcare, and supply chain management. South Korea and Japan's financial industries are rapidly adopting blockchain, while Singapore is emerging as a hub for blockchain startups. Australia and India are also exploring the potential of blockchain technology in areas, such as supply chain management and identity verification. In particular, the adoption of blockchain technology by many Asian countries, centered around South Korea, provides significant opportunities for companies and investors to leverage blockchain technology and reap the benefits.



03 WHY RYSEN?

3.1 World's Fastest Mainnet Technology

In the age of blockchain commercialization, scalability is the most important factor. The key to scalability lies in speed, measured by TPS (transactions per second), which refers to the number of transactions that can be processed in one second. The ability to increase transmission capacity without difficulty as the number of users and transactions increases is crucial.

Currently, the first-generation cryptocurrency, Bitcoin and the second-generation cryptocurrency, Ethereum are widely used for P2P transactions, but users are experiencing the limitations of these blockchain technologies as they face the problem of slow transaction speed (TPS). As an alternative to address this issue, the third-generation cryptocurrency EOS has emerged, but there are still issues related to TPS, such as the inability to process a part of coin transfers immediately.

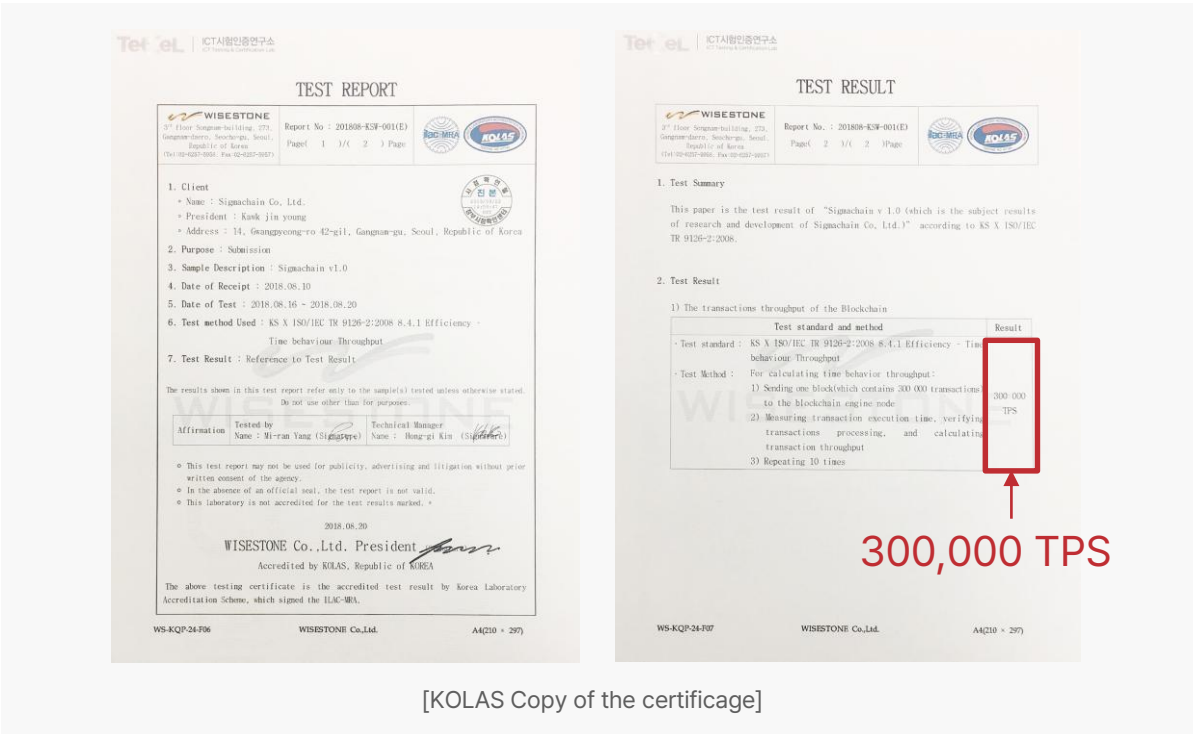
One of the world's largest card companies, Visa, is known to handle 24,000 TPS transactions. In contrast, Bitcoin records an average of 7 TPS, Ethereum records 20 TPS, and EOS records around 3,000 TPS. With significantly slower speeds compared to traditional financial services, each project is making great efforts to improve this issue.

The TPS of blockchain software can vary depending on not only the design of the software, but also the hardware performance and network performance that drive the operation, generation, and verification of blocks. The type of transaction can also affect TPS. For example, a smart contract transaction may require more computation than a simple payment transaction, resulting in a longer processing time. Even contracts that perform the same function can require more computation and time depending on their implementation in code.

RYSEN has overcome these limitations and developed a mainnet that can handle fast speeds of up to 300,000 transactions per second, which can bring scalability.

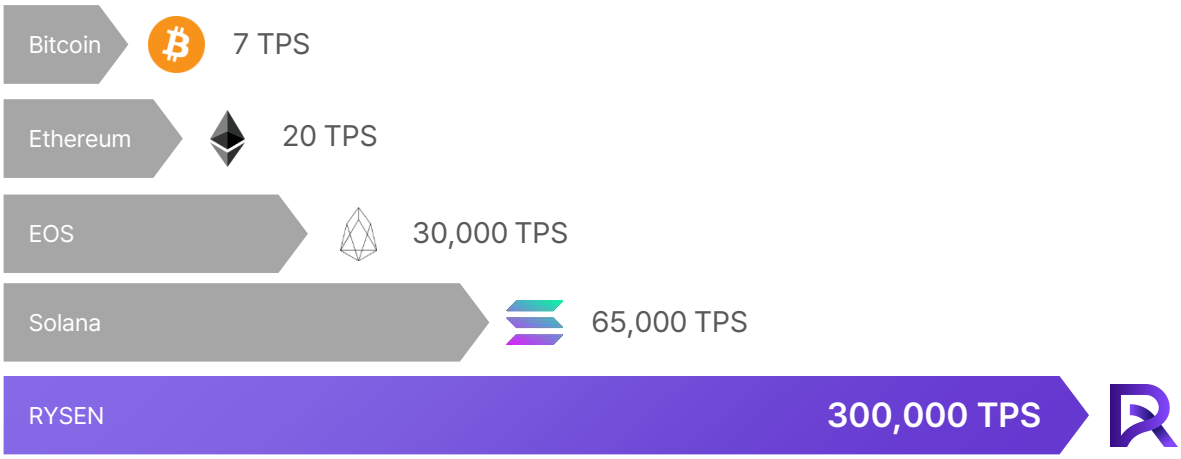
The RYSEN mainnet, previously known as SIGMACHAIN, has been recognized by KOLAS, a Korean national certification agency that is mutually recognized with certified exam results issued in 72 countries worldwide. The mainnet performance TPS (transactions per second) test resulted in achieving 300,000 TPS. This recognition allows RYSEN to overcome the limits of blockchain processing speed with 300,000 TPS and enables stable and quick development of various services.

Below is the TPS test result certificate for RYSEN.



[KOLAS Copy of the certificage]

TPS Comparison of Major Mainnets



3.2 Differentiation of Mainnet with Proprietary Consensus Algorithm

Bitcoin and Ethereum use the PoW (Proof of Work) algorithm to create blocks. These companies use GPUs to perform hashing operations until they find a number that is smaller than the given bits value. Therefore, expensive equipment is required for these operations, and the cost is much higher than the amount of cryptocurrency mined, which is a disadvantage of the PoW algorithm.

To reduce high costs as such, several other cryptocurrencies have introduced a PoS (Proof of Stake) block creation method where blocks are randomly generated, and nodes with a higher stake have priority based on the probability of random block creation. However, giving block creation priority to nodes with a higher stake becomes a significant obstacle to the mainstream adoption of blockchain technology.

Therefore, the Graphene engine improved upon this by introducing a democratic voting mechanism to elect master nodes and create blocks in a random order using the DPoS (Delegated Proof of Stake) method. DPoS addresses the shortcomings of PoW and PoS block production methods, but this method has the disadvantage of the number of nodes being predetermined and not very high. Therefore, there is a possibility that 51% of the elected master nodes may be corrupted, leading to issues in block production.

RYSEN has developed an innovative consensus model, the DRPoS (Delegated Random Proof of Stake), which is a fourth-generation consensus method that complements the DPoS and DDPoS models. The DRPoS model randomly selects both block producers (BP) and block observers (BO) to allow a fair and stable block generation. This prevents centralization in large-scale blockchain networks, ensuring the stability and reliability of the entire network. Unlike PoW, the DRPoS model does not require any cost consumption, nor does it generate any costs for using the blockchain. Even if the master node is contaminated, the selected random node (BO) can prevent contamination and maintain integrity, thus, solving both vulnerabilities in centralization and security. DRPoS is one of the factors that make RYSEN one of the most powerful, flexible, and scalable mainnets in the world.

3.3 NFT Platform that Satisfies All

RYSEN provides a convenient and highly useful environment for both NFT-related developers and DApp developers on other mainnets.

Other Mainnet NFT related DApps

- Ethereum DApp
- EOS DApp
- Tron DApp
- Klayth DApp

RYSEN's NFT Mainnet

- NFT standard RTO602
- Support Transaction sppeed 300,000 TPS
- Lowest transaction fee in the industry
- Register and pay NFT transaction fees with RYSEN coin

Benefits of entering RYSEN NFT DApp

The company that enters can select the coin they want and pay for NFT transactions.

For example, company A issues tokens with Ethereum's ERC-20 and creates an NFT DApp on RYSEN. In the NFT market created by company A, it is possible to pay for NFT transactions with A company's ERC-20 tokens.

RYSEN's mainnet is suitable for NFT solutions due to its high transaction processing capabilities, strong security, compatibility with other blockchain protocols, support for smart contracts, and low transaction fees.

Firstly, RYSEN's high transaction processing capabilities are ideal for NFT solutions that require fast and efficient processing. Additionally, the platform has strong security measures in place to protect NFTs from unauthorized access or hacking attempts.

Secondly, RYSEN is priced at the lowest cost compared to the fees charged by existing NFT industries, which can contribute to the activation of NFT trading. Furthermore, RYSEN's compatibility with other blockchain-based applications enables the creation of more complex NFT-based applications.

Thirdly, RYSEN's NFTs can be traded with the coins desired by DApps, contributing not only to scalability but also to the appreciation of its own token value. RYSEN's smart contract functionality allows for the creation of programmable NFTs that can be used for various purposes, such as access keys or exchange mediums for digital assets.

3.4 Providing Optimal DeFi Environment

The RYSEN mainnet is a blockchain protocol designed to provide a secure and scalable platform for decentralized applications (DApps) and decentralized finance (DeFi) solutions. The following are reasons why RYSEN's mainnet is suitable for DeFi:

- Scalability: The RYSEN protocol is designed to scale and handle a high volume of transactions. This makes it ideal for DeFi applications that require fast and efficient transaction processing.
- Security: The RYSEN protocol is built with a strong emphasis on security. It uses advanced cryptography and consensus algorithms to ensure that all transactions are secure and tamper-proof.
- Interoperability: RYSEN is designed to be compatible with other blockchain protocols. This means that DeFi solutions built on RYSEN can easily interact with other blockchain-based applications.
- Smart Contract Functionality: RYSEN supports smart contract functionality, which is essential for DeFi solutions. Smart contracts allow for the creation of complex financial instruments, such as decentralized exchanges, lending protocols, and stablecoins.
- Low Fees: RYSEN has low transaction fees, making it cost-effective for DeFi applications. This is especially important for DeFi applications that involve small transactions, such as micro-lending and micropayments.

RYSEN provides secure, transparent, and customizable solutions for e-commerce companies. By utilizing smart contract functionality, it ensures that transactions are automatically executed without intermediaries such as banks or lawyers when the transaction conditions are met. This promotes efficiency, transparency, and security, providing benefits to both buyers and sellers.

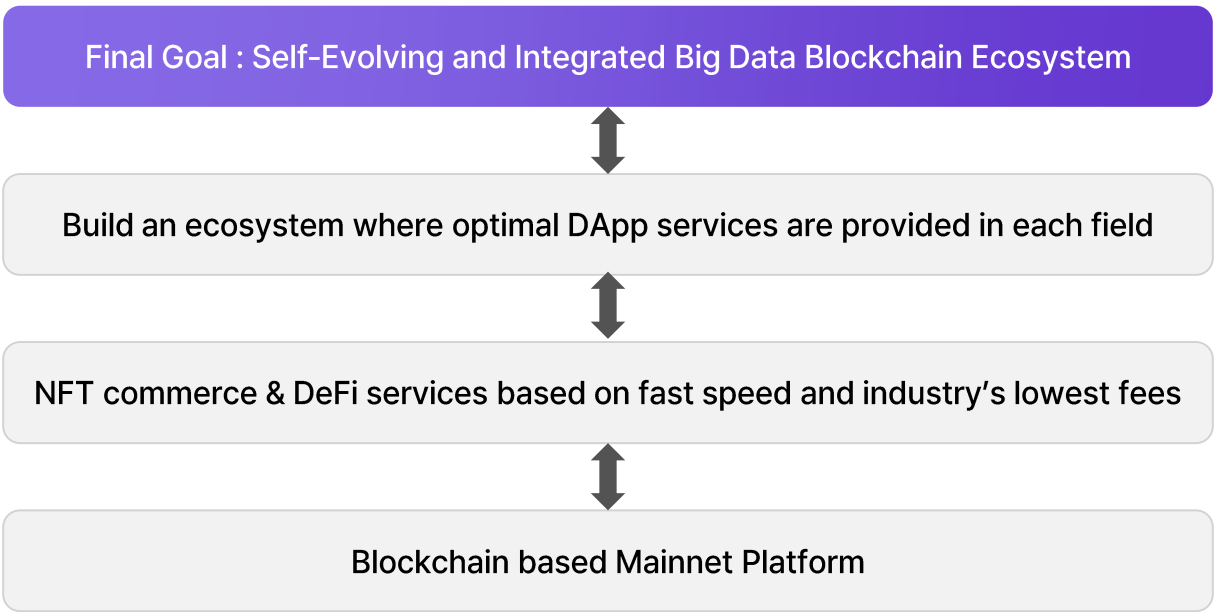
Furthermore, RYSEN provides a decentralized platform that is not controlled by a single institution or organization. This feature promotes fair competition and minimizes the risk of monopolies, ensuring that companies can thrive through fair competition in the e-commerce market.

With its customizable and decentralized nature, RYSEN has become an ideal solution for e-commerce companies looking to build a solid foundation for smooth operations and business success.

3.4 RYSEN : Features and Benefits

Mainnet Differentiation	• World's fastest mainnet technology – certified 300,000 TPS • Unique consensus algorithm (DRPoS) – enhances speed, security, scalability, and decentralization • Decentralized API development environment • First mainnet to operate in both Linux & Windows environment • High data intensive, hard fork test environments with debug model service for large scale testing and data quality assurance
DApp Development	• DApps: flexibility to use preferred programming language • Rapid development at a low cost with DAPI • RYSEN offers over 150 APIs for DApps to access for a rapid development and deployment environment • API offers modules such as live streaming, smart wallets, communication networks, P2P Cloud, and more • Decentralized Single Sign On (DSSO) and Decentralized Single Transfer On (DSTO) included to enhance security & data protection
NFT Platform	• Transaction fees priced at the lowest cost compared to existing NFT industry standards • Helps increase value of DApps tokens • RTO602 NFT Standard Protocol incorporates non-fungibility that are unique, one-of-a-kind items or collectibles
DeFi Platform	• RYSEN offers its services at the industry's lowest fees • Fastest TPS offering near real-time transactions • Offer more flexibility in development languages including Java/ C/C++/PHP/ASP and more
DID (Decentralized ID)	• Decentralized Single Sign On (DSSO) • Decentralized Single Transfer On (DSTO) • Prevent personal information hacking • Ensures that users encrypted assets and transactions are completely protected

04 RYSEN GOAL



RYSEN's ultimate goal is to build an integrated blockchain technology that fully satisfies the demands of end-users and to play a leading role in advisory, research, and development fields with high scalability and real problem-solving capabilities.
RYSEN's mainnet has fast transaction processing capabilities of 300,000 TPS and low fees, providing speed, stability, and scalability. With this, RYSEN is focusing on building a blockchain ecosystem and popularizing blockchain technology. With a low-barrier entry and an environment to provide the highest-performing services, RYSEN aims to accelerate the popularization and commercialization of the blockchain industry by outstanding DApps in various fields to take part in our daily lives with the RYSEN mainnet network.

To achieve this goal and respond to the changing demands of DApps and the blockchain industry, RYSEN is dedicated to continuously innovating and improving its mainnet. It focuses on developing blockchain technology and mainnet functionality, such as achieving speeds of 300,000 TPS, to provide users with a smooth, efficient, and scalable platform. Our top priority is to establish ourselves as a trusted leader in the blockchain community by prioritizing the security of user assets, scalability, and personal information protection.

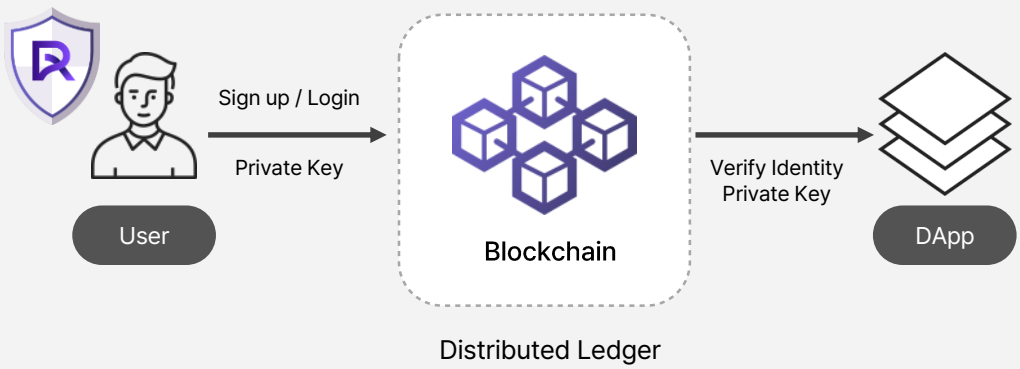
05 RYSEN ECO-SYSTEM SOLUTION

5.1 **RTO23** (RYSEN Standard Fungible Token)

RTO23 is a type of token standard protocol, similar to Ethereum's ERC-20. The protocol serves as a guideline for tokens that are generated within the RYSEN ecosystem, and is composed of over 150 custom Application Programming Interfaces (APIs) that help reduce the cost and time for Dapp development.
It includes features such as Decentralized Single Sign On (DSSO) and Decentralized Single Transfer On (DSTO), which provide complete protection and secure transmission of all data, including personal information and coin transaction records. In addition, RTO23 is the first mainnet to operate not only on Linux but also on the Windows environment.

5.1.1 **DSSO** (Decentralized Single Sign On)

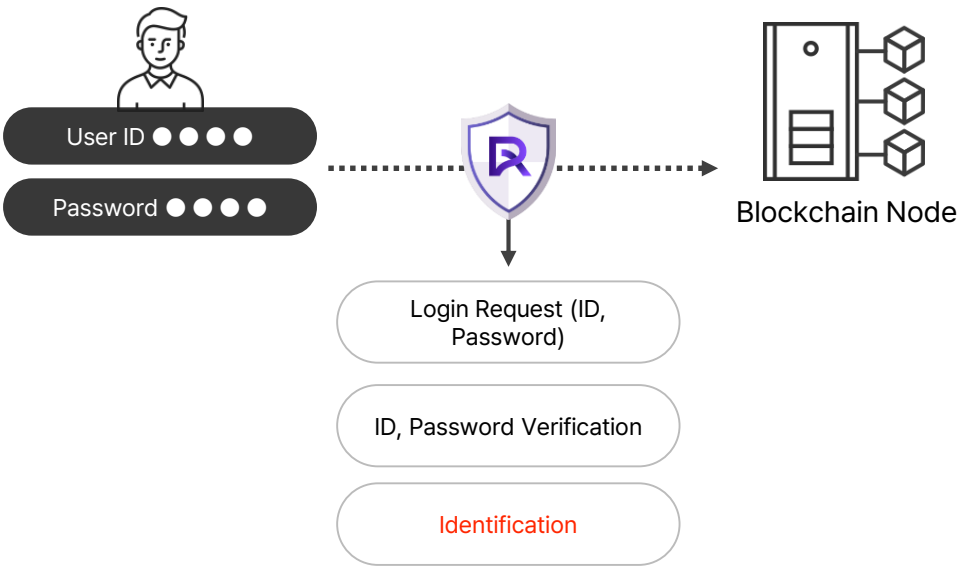
Decentralized Single Sign-On (DSSO) is a login access method based on decentralization, where users can directly access blockchain nodes with their own keys and authenticate themselves on the blockchain. Only the authenticated results are then transmitted to the DApp, thereby preventing any potential personal information hacking or leakage that may occur within the DApp. Additionally, users can store their IDs securely on the blockchain and protect them from potential threats.



The problems of the current ID

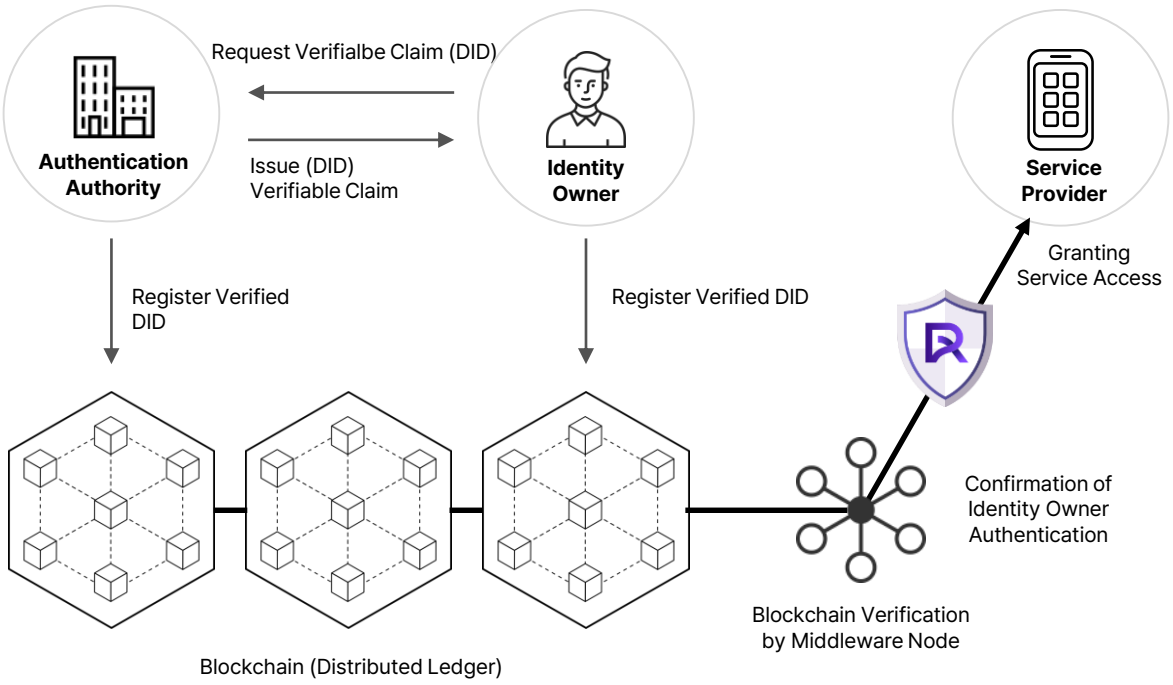
The application stores information about personal IDs and passwords, making it vulnerable to external hacking risks and allowing applications to access user ID and other information.

DSSO Solution



The personal ID information exists on the 'blockchain node', and external hacking of the blockchain node is impossible. Unauthorized use of ID information without user consent is also impossible.

With the emergence of verifiable credentials, it is now possible to obtain a DID (Decentralized Identifier) for identity verification purposes. DID is a digital ID that can be verified by a trusted third party and contributes in enhancing privacy and security in various industries, such as finance and healthcare. RYSEN's DID allows identity providers and identity verification authorities to store IDs on the blockchain and receive Verifiable Claims from the verification authority on a one-time basis. When signing up or logging in to a service, a middleware node verifies the identity and only provides the service provider with a binary (yes or no) response, ensuring that no third party has access to the identity information.



1. DID application: To receive a DID from a certification authority, an application must be submitted including personal information and necessary documents. The certification authority reviews this information and issues a unique DID. DID registration: The issued DID must be registered on a distributed network, such as a blockchain to be recognized and used for authentication and verification purposes.
2. DID usage: Once the DID is registered on a distributed network and a DID certificate is created, the DID can be used for various purposes, such as authentication, verification, and communication.

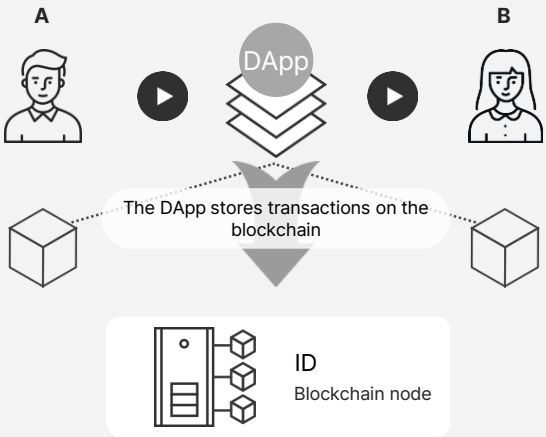
5.1.2 **DSTO** (Decentralized Single Transfer On)

DSTO provides complete protection for users' encrypted assets and transactions. When transferring digital currency, individuals directly access the blockchain node with their owned key to execute the transfer on the blockchain. The transferred result is then sent to the DApp, preventing hacking and leakage of transfer information that could occur within the DApp.

Example of DSTO usage

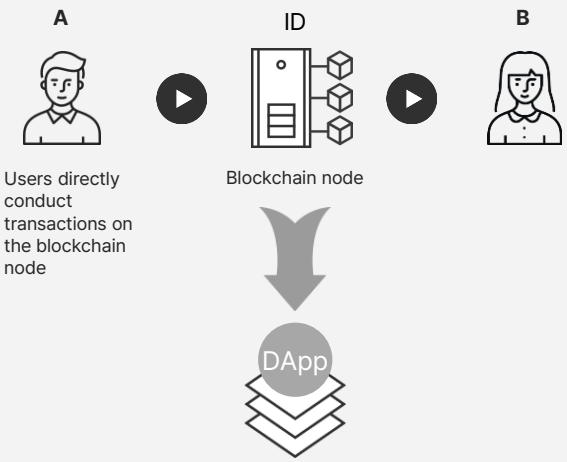
User A sends money to User B

Conventional payment method



Since users conduct token transactions through the DApp, the DApp can view the transaction history, which poses a risk of hacking.

DSTO method



Token transactions are carried out on the blockchain node, so the [exchange → transfer] process is also securely protected. Only the parties involved in the transaction can access the transaction details.

5.1.3 **DAPI** (Decentralized Application Program Interface)

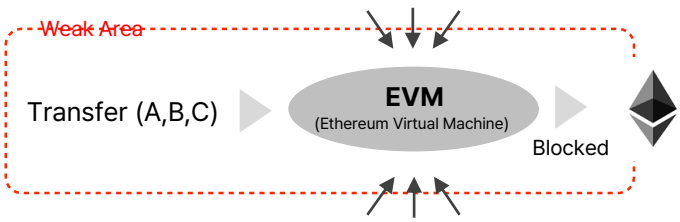
DAPI is a connectivity program provided by RYSEN, connecting RYSEN with the Dapps, for convenient development of DApps that run on the RYSEN platform. Without the need for separate systems or development language(s), developers can use RYSEN's blockchain with their preferred programming language(s) to directly connect to the distributed network. In addition to providing RYSEN's mainnet core engine API, DAPI also provides useful modules, such as live streaming, smart wallets, communication networks, and P2P cloud APIs. More than 150 APIs have been developed, and both Windows and Linux environments are supported.

Coding to execute a smart contract "A sends B a C amount of tokens" using RTO23 API: A → B, C(100 tokens)

The difference between using RYSEN API and Ethereum EVM

DApp Transfer (A,B,C)

[Solidity – Programming Language]

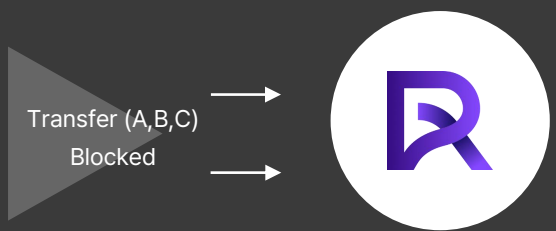


Learn the programming language created by Ethereum, write the code, upload it to EVM, compile it,

EVM will then store it on the blockchain.

DApp Include(RYSEN API) Transfer (A,B,C)

[C, C+, JAVA]

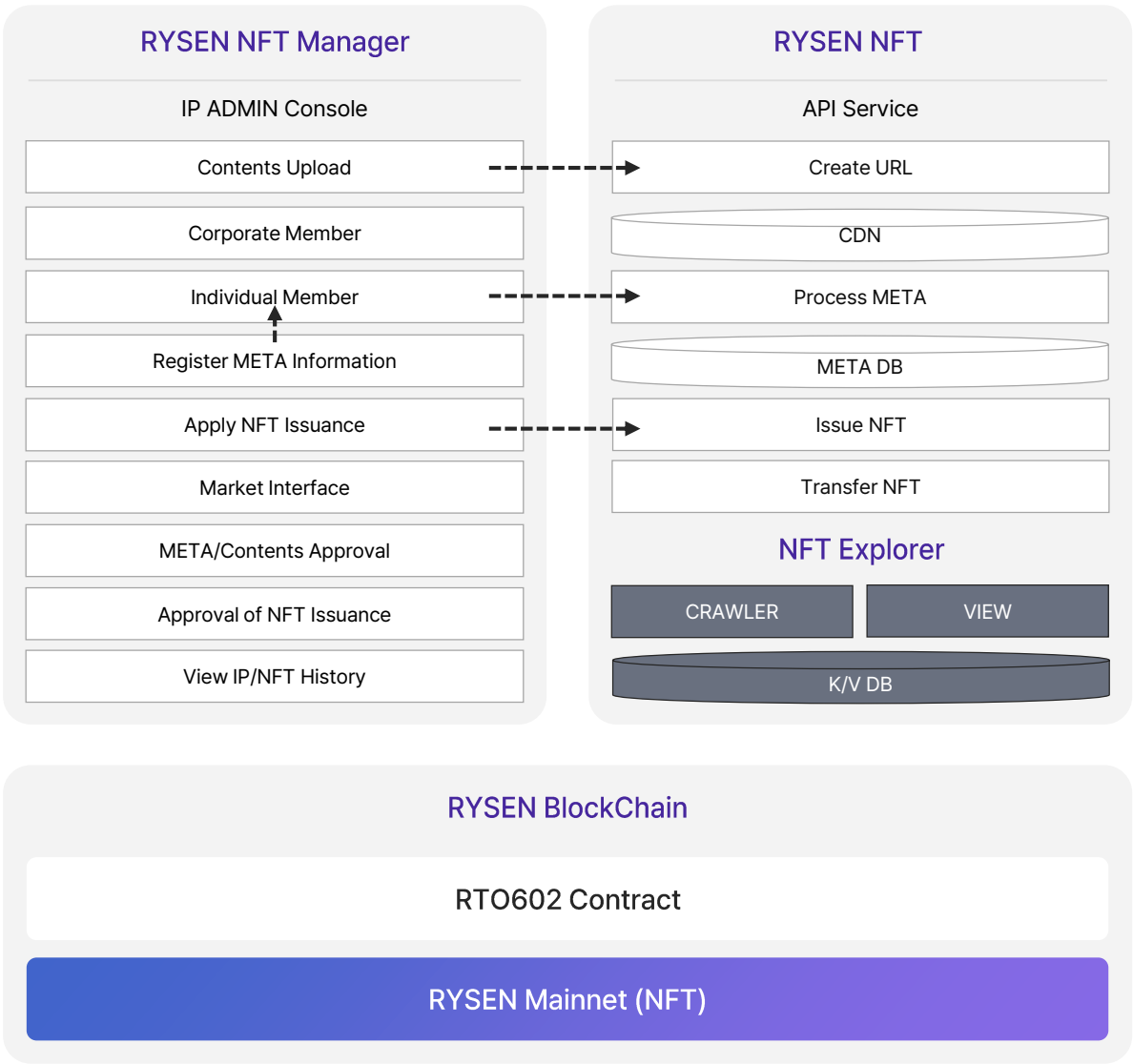


Directly save information through API
provided by RYSEN, using a programming language familiar to the developer.

5.2 **RTO602** (RYSEN Non-fungible Token Standard)

RTO602 is the NFT standard protocol of the RYSEN network, which enables the creation of digital or physical assets as NFTs on the mainnet. Even with a large volume of NFT transactions, the transactions can be processed on the network without burden with a speed of up to 300,000 TPS, and can be made at a low fee.

5.2.1 **RYSEN NFT Platform**



5.2.1 RTO602 API

RTO602 is an open protocol to build non-fungible, or unique tokens on the RYSEN blockchain. While most tokens are fungible, or interchangeable, RTO602 tokens are all unique, meaning they represent one-of-a-kind items or collectibles.

Non-fungible : Unique items with varying values
Deed : Proof of ownership (rights)

RTO602 Event

Register	Registration of NFT ledger
Transfer	Transfer of Ownership
Approval	Approval of Transfer of Ownership
ApprivalFor All	Approval of Transfer of Ownership for all

RTO602 Function

comment_registration	Registration of NFT ledger
create_token_operation	Create Token
transfer_token_operation	Transfer Token
get_token_balance	List of token balances for a specific account
comment_transfer	Transfer NFT ownership
staking_token_fund	Token staking
getAccounts	Retrieval of account information
getOrderBook	Retrieval of orders

Other functions can be found in the guide

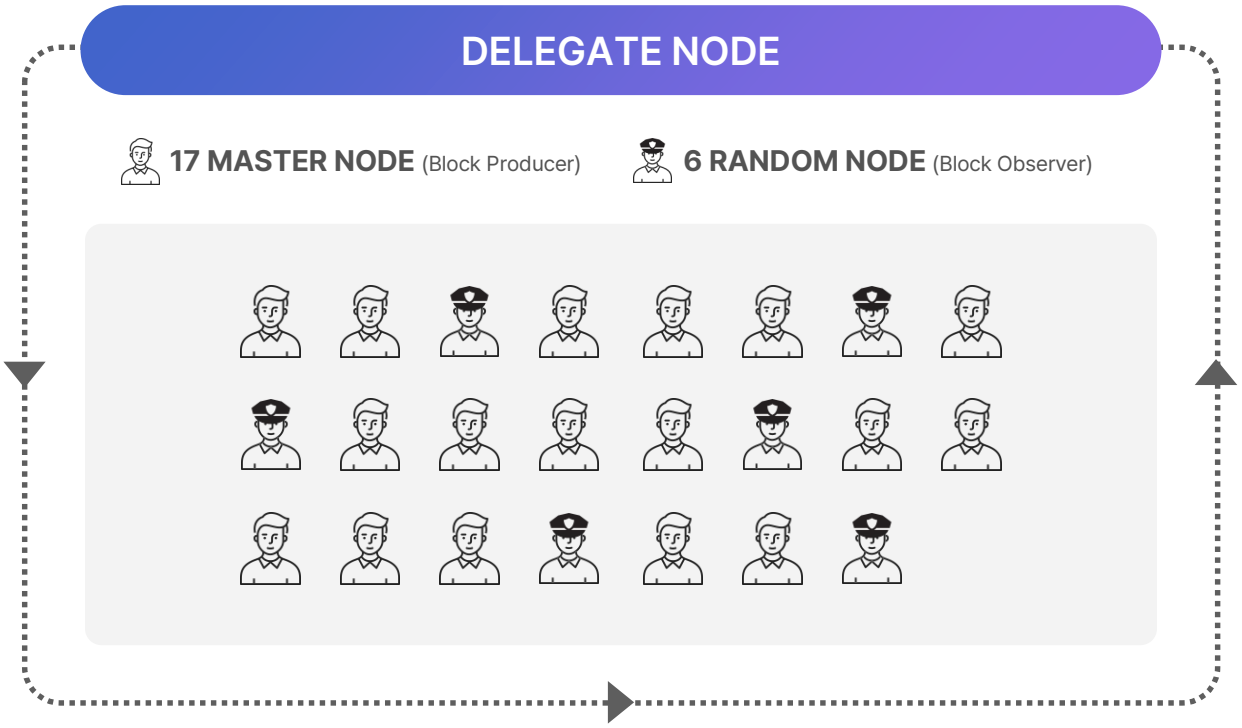
5.3 Block Production Algorithm (DRPoS)

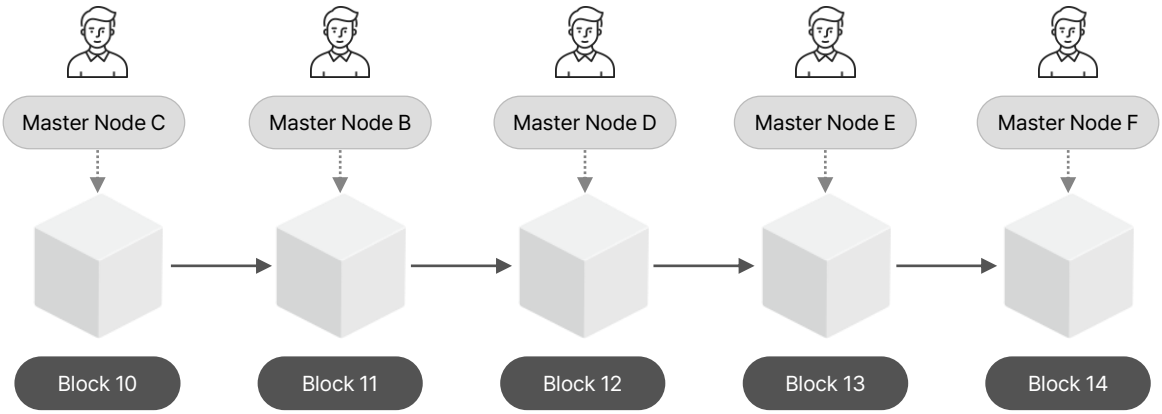
Bitcoin and Ethereum use the PoW (Proof of Work) consensus mechanism for block generation, which involves changing the nonce value through hashing operations on GPUs until the hash value of the block header is less than the specified bits value, thereby creating a block. However, this method requires expensive equipment with high computational power and consumes a significant amount of energy compared to the amount of mining rewards obtained.

To reduce costs, several other cryptocurrencies, such as Qtum have developed the PoS (Proof of Stake) block generation mechanism, which randomly generates blocks and gives priority to nodes with a higher stake in the network's tokens, based on the probability of the random generation.

However, giving block creation priority to those who hold a larger stake becomes a major obstacle to the widespread adoption of blockchain technology. This is why the Graphene Engine improved the PoS (Proof of Stake) block creation method, which gives priority to nodes that hold a larger stake based on random block creation, by introducing a democratic voting system to elect master nodes and randomly creating blocks in the order of master nodes, called DPoS (Delegated Proof of Stake). This method also addresses the drawbacks of PoW and PoS block production methods, but since the number of nodes is predetermined and not very high, there is a disadvantage that there is a possibility of 51% of the elected master nodes being corrupted.

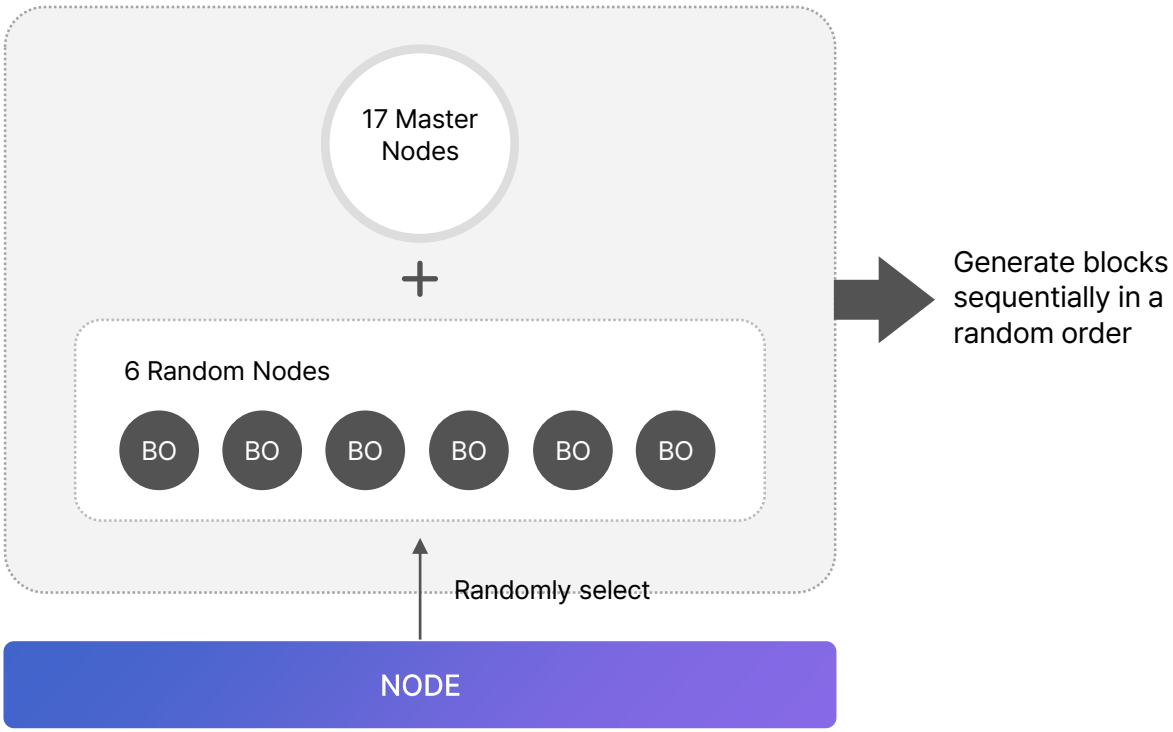
On the other hand, RYSEN's DRPoS (Delegated Random Proof of Stake) is a method in which 17 elected master nodes and six randomly selected random nodes (BO) work together to create blocks in a random order to maintain the integrity of the entire blockchain. This block production method has no cost, and there are no fees incurred for using the blockchain. Even if a master node is compromised, the randomness of the selected BO nodes prevents corruption and maintains integrity. Furthermore, DRPoS enhances security, scalability, and decentralization, strengthening all elements of the trilemma.



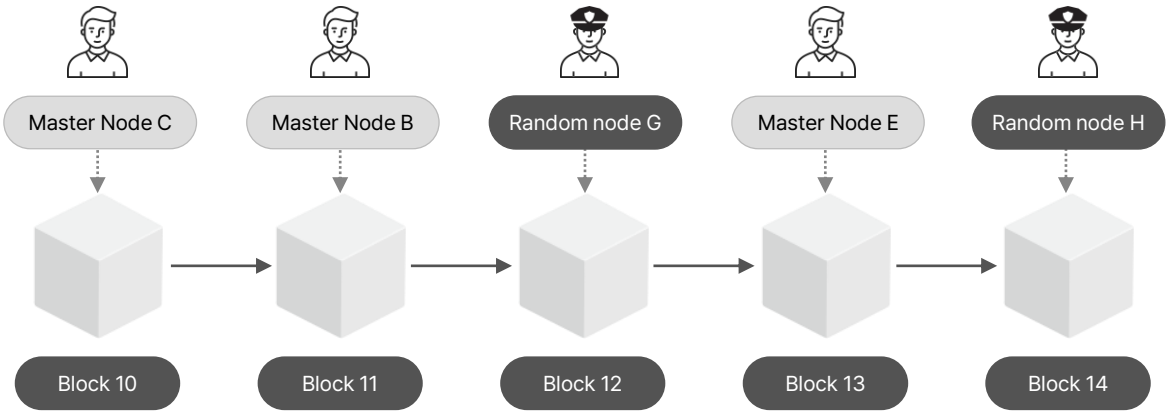


<Figure1. structure for block generation in the Graphene Engine>

Figure 1 illustrates the structure for block generation in the Graphene Engine. In this structure, a predetermined set of master nodes (C, B, D, E, F) sequentially generate blocks (10, 11, 12, 13, 14) in a random order. The master nodes have the authority to generate blocks that make up the blockchain, and the decision regarding this authority is determined through voting among the members at regular intervals. Ordinary nodes, on the other hand, are nodes that have a copy of the blockchain data but generally do not have the authority to generate blocks.

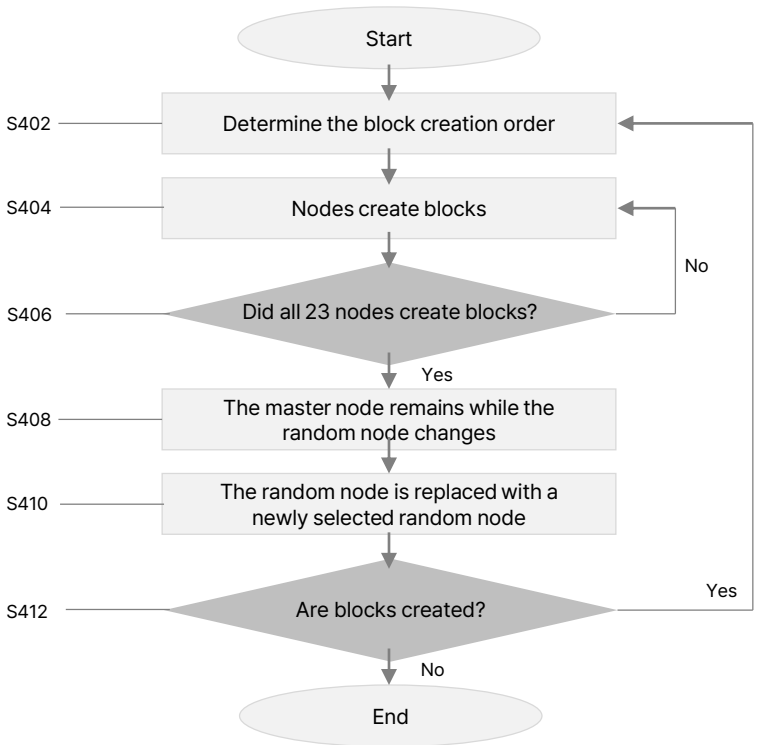


<Figure2. DRPoS Algorithm>



<Figure3. structure for block generation in the RYSEN>

Figures 2 and 3 are block generation structure diagrams improved by the DRPoS algorithm. These figures portray how the present invention randomly selects a certain number of nodes (BO) from the general nodes, and these nodes (BO) and master nodes (BP) generate blocks together in random order.



<Figure 4. Flow of Block Generation >

Figure 4 illustrates the flow of block generation according to the DRPoS algorithm. After determining the block generation order for 23 master nodes (BP) and random nodes (BO), all nodes are allowed to create blocks. Then, the master node (BP) remains the same while the random nodes (BO) are reselected, and this process is repeated.

5.4 Blockchain Creation

RYSEN is designed to facilitate communication between blocks. Blocks are created every 3 seconds, with a maximum of 23 nodes involved in their creation. These 23 nodes carry a selected master node(BP) and randomly selected nodes(BO) to secure stability each round (every 23 block creations). All of these nodes participate in block creation. During this block creation round, each node supports the validation of blocks and transactions.
In comparison to block creation methods using hash links, the verification time and bandwidth for chain proof is optimized with close to non-existent overhead . As there are 23 block producers set who create blocks in 3 seconds, determining irreversibility takes 51 seconds.

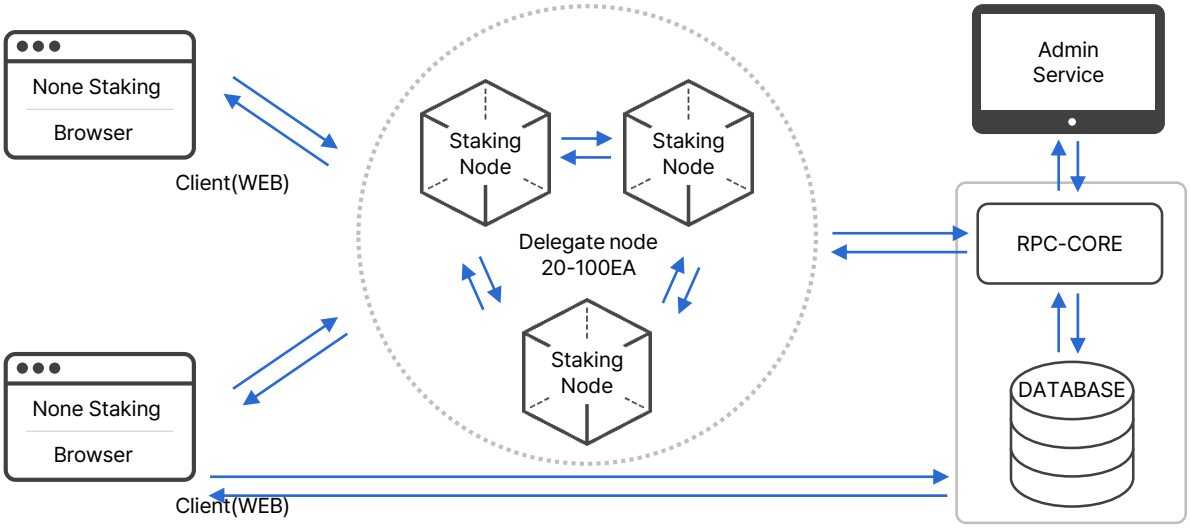
5.5 Monitoring & Performance Improvement

RYSEN provides web-based monitoring services for nodes and block generation results. Through the web service, the order of block generators, block generation results, and any failures in the generating node can be easily checked.

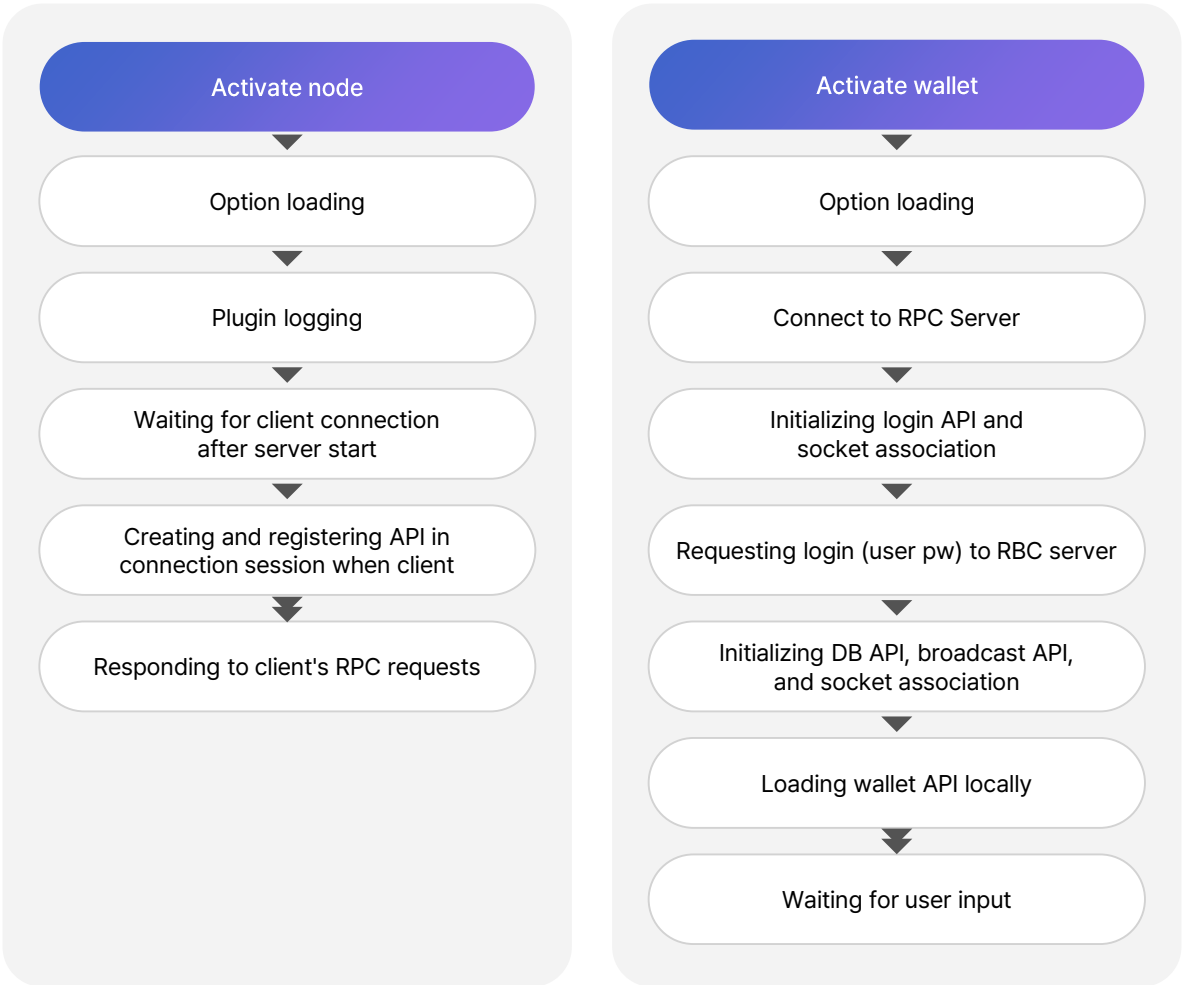
Additionally, the current status of the blockchain engine, including transaction processing and block generation times, can be easily monitored.

RYSEN's blockchain also provides hard forks for engine improvements through debug nodes without registering with the blockchain service network. The debug node not only allows monitoring of the blockchain network status, but also enables development without affecting the currently operating blockchain service. For example, recording data for 10 billion users in the currently operating blockchain memory or physical disk is almost impossible. However, for performance improvements or testing, developers may face the issue of actually recording the data on the blockchain, and in this case, development can proceed through a separate debug node that is detached from the blockchain service.

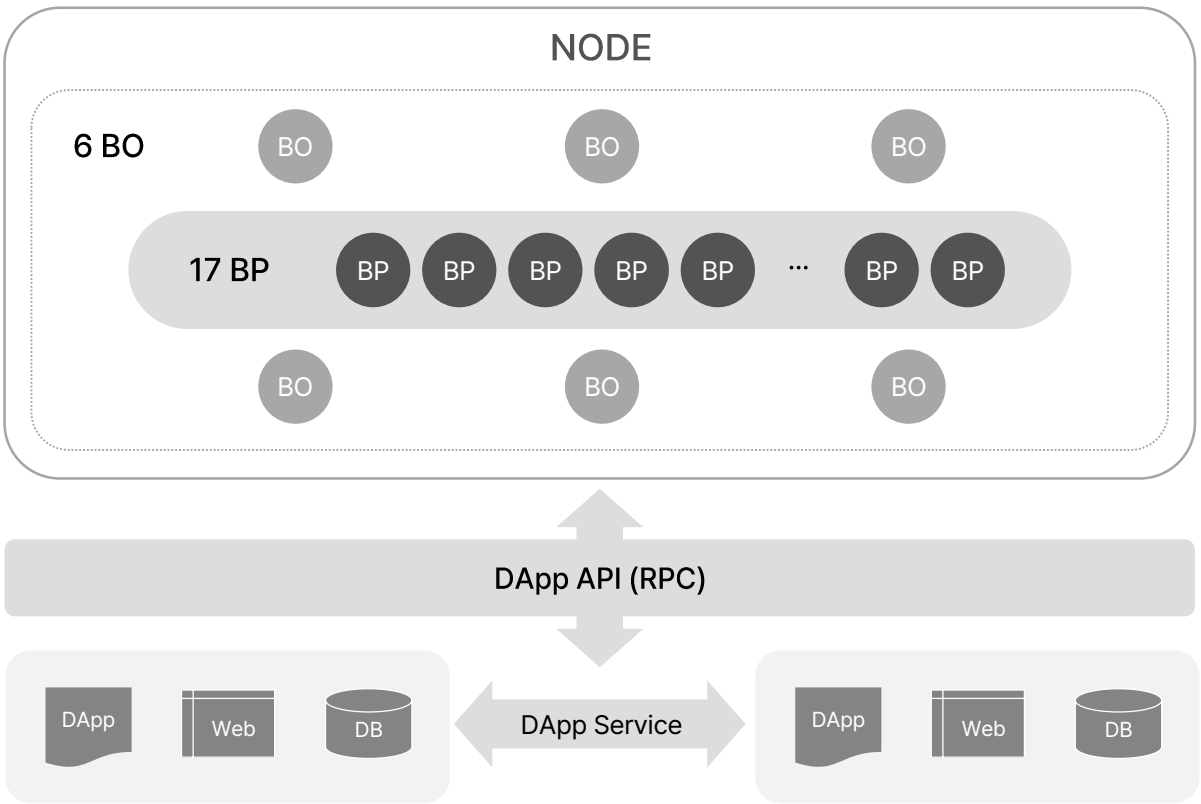
In cases where changes need to be made to the blockchain engine database for 1) improving functionality and performance of the operating blockchain, 2) resolving development issues by changing the time of the blockchain node, or 3) preparing for hard forks, RYSEN provides a debug mode service where such changes can be applied in advance for debugging.



<Figure1. Structure of RYSEN blockchain system>



<Figure 2. Summary of communication between RYSEN node and wallet>



<Figure3. RYSEN Blockchain system >

5.6 Differentiation in SmartContract Processing

Developing and implementing smart contracts on blockchain platforms like Ethereum or EOS can be complex and time-consuming. In order to implement a smart contract on such platforms, developers need to write program code, compile it, and upload the contract to the mainnet server. This process can be challenging and may require a significant amount of development time.

RYSEN, however, provides a simple and efficient way to develop smart contracts. Developers can easily create smart contracts on RYSEN by calling the APIs provided by the mainnet. They can create and deploy smart contracts quickly and easily through the development environment provided by RYSEN blockchain.

Going forward, RYSEN plans to implement smart contracts using SQL commands, further streamlining the development process of smart contracts. This will simplify the process of creating and implementing smart contracts by allowing interaction with the databases provided by the blockchain. RYSEN is designed to allow developers to develop and apply smart contracts more easily. This means that blockchain technology can be applied in various industries such as e-commerce, supply chain, finance, and more.

Ex) Token-related APIs for DApps that RYSEN will provide in the future

5.6.1 Create

To create a token, call the function below.

```
$token ->create_token($reauired_auth, $name, $symbol_name, $publisher, $init_ amount );
```

Argument Description

required_auth	Creating user's active key
Name	Token name
symbol_name	Token symbol
Publisher	Account ID of the user
init_amount	Initial amount

5.6.2 Transfer

To transfer a token to another user, call the function below.

```
$token ->transfer_token($reauired_auth, $from, $to, $amount, $symbol_name, $memo);
```

Argument Description

required_auth	Active key of sending user
From	Account ID of sending user
To	Account ID receiving user
Amount	Token amount to be sent
symbol_name	Token symbol
Memo	Memo

5.6.3 Display Balance

To check the user's balance, call the following function.

```
$token ->get_token_balance($account);
```

Argument Description

Account	Token owner's account

5.6.4 Burn

This is a function to delete the tokens that the user possesses. Typically, the issuer of the token calls this function to reduce the total quantity of the token.

```
$token ->burn_token($required_auth, $account, $amount, $symbol_name);
```

Argument Description

required_auth	Active key of Token owner's account
Account	Token owner's account ID
Amount	Number of tokens to be erased
symbol_name	Token symbol

5.6.5 Error Handing

For example, if it is running, the result is returned by the operation related to the called function.

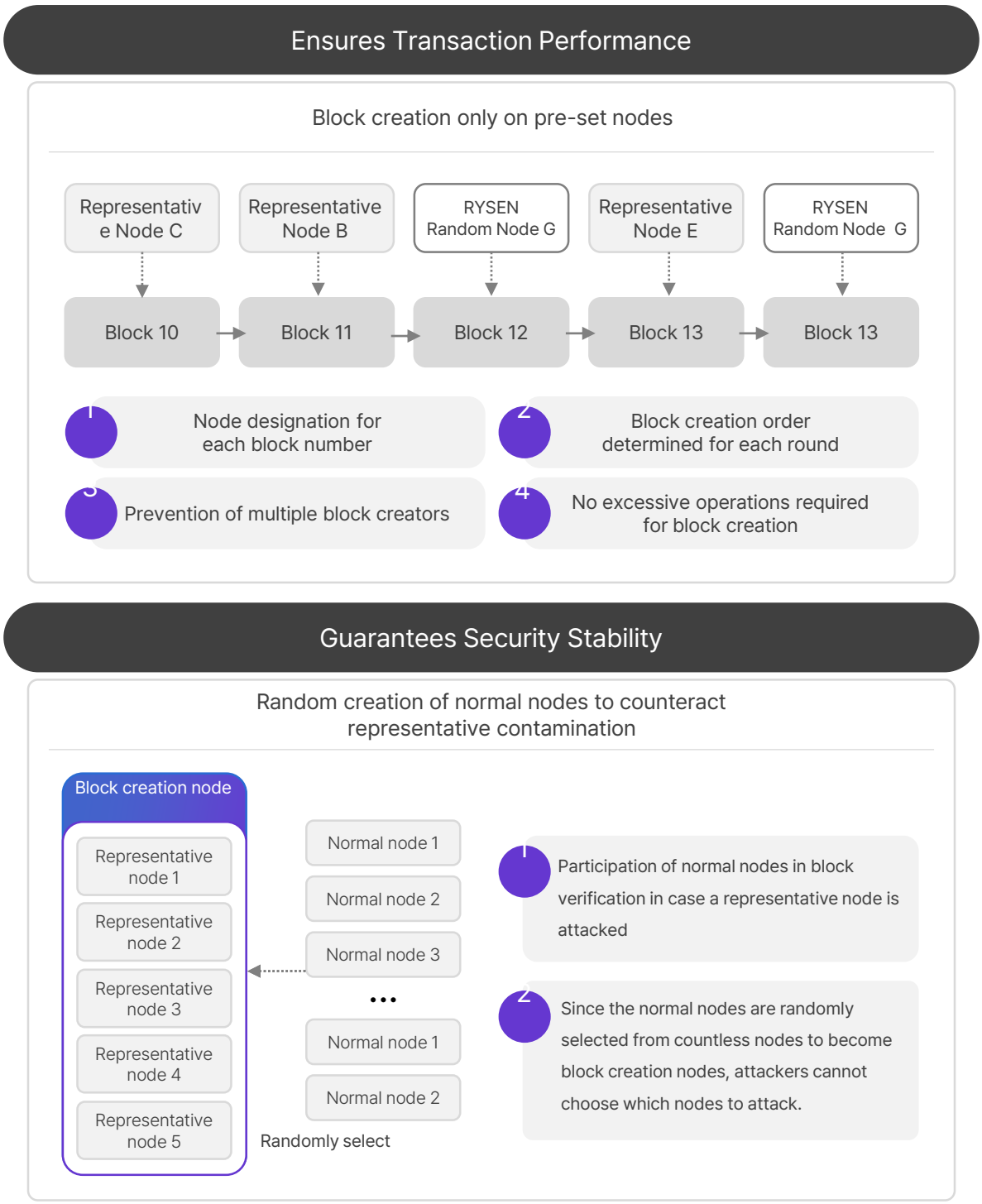
```
$response = $token->burn_token($required_auth, $account, $amount, $symbol_name);
```

The following result values are returned.

```
if($response->statys == "success")    // success
{
}
else   // fail
{
$code = $response->result->cause->payloard->error->code;
$message = $response->result->cause->payload->error->message;
}
```

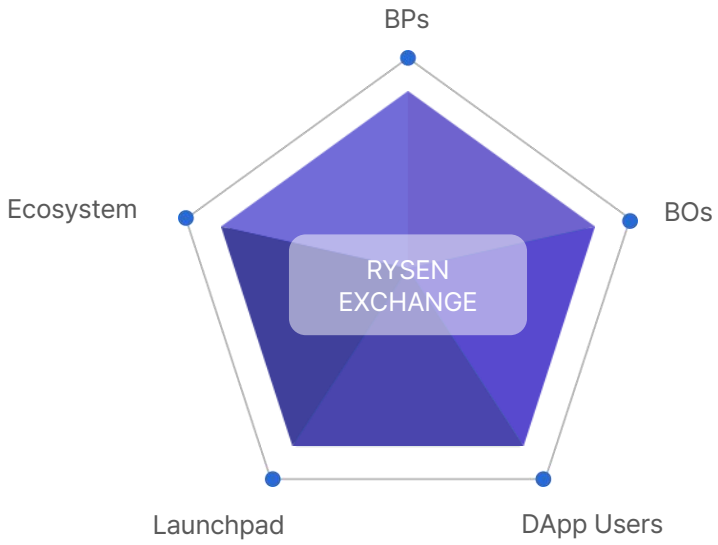
5.7 Enhancement of Network Processing Speed and Security

RYSEN provides the world's fastest network processing speed and security stability through a consensus algorithm that does not require excessive operations for block creation and a double verification process.



<Figure1. Blockchain-based block verification method >

06 RYSEN COIN SYSTEM



<Figure 1. RYSEN Coin system>

Proof of Work (PoW) is a consensus mechanism where the person who solves a difficult calculation among all those who participate in direct democracy creates a block, and the consensus is reached when more than 51% of the people agree to it. However, this process takes a lot of time and effort for both calculation and consensus. Proof of Stake (PoS) is a consensus mechanism where the person who holds the most stake creates the block, and 51% of the people agree to it. However, there is a risk that those who hold a significant amount of stake may act recklessly.

RYSEN proposes a new consensus mechanism called DRPoS (Delegated Random Proof of Stake). In DRPoS, nodes select block producers (BP) through voting, similar to EOS. To address the issue of collusion or attacks against certain BPs, RYSEN introduces the Block Observer (BO) system, where a randomly selected BO and BP participate in block production together in each round.

RYSEN proposes a coin economy model where DApps, as participants of the mainnet, work together with RYSEN to sustain the network instead of imposing transaction fees like Ethereum or pre-paying for network, CPU, and memory usage like EOS based on network usage.

As the owner of the RYSEN mainnet is the user, no costs are imposed on users. DApp companies are also only charged minimal fees to maintain the system, without excessive charges during the initial service period. Instead, RYSEN coin holders and ecosystem funds invest in outstanding DApps with coins. Upon participation, RYSEN and DApp tokens are listed on the internal exchange, enabling real-time trading, making it easier for DApps to raise funds and guaranteeing refundability for DApp participants.

To maintain and operate the mainnet, RYSEN rewards Block Producers(BP) with newly issued coins as financial incentive. In addition, the BP has the authority to review and grant participation to DApps, seeking to enter the RYSEN mainnet under favorable conditions.

Not only limited to BPs and BOs, coin holders are also granted the right to participate in DApps. The value of non-RYSEN tokens from external DApps are recognized with the internal exchange rate, preventing any disadvantage and ensuring voting rights for DApp participants, such as in BP selection. RYSEN's ecosystem is a system that grows with the growth of DApps.

6.1 BP (Block Producer)

Individuals who hold RYSEN coins and DApp tokens have the privilege of becoming a Block Producer(BP) in the order of receiving the most votes. To be selected as a BP, RYSEN requires coin holders to be equipped with a system that safely creates and maintains a blocks. Additionally, coin holders must deposit a certain amount of money to cover potential liability for damages that may occur in the future. This deposit will be used as compensation in the event that the BP causes damages, and will be refunded if the BP resigns. BP votes are calculated based on the number of coins, or DApp tokens held each month to ensure the efficient operation of the mainnet.

BP is equally compensated based on the network usage fees for the number of wallets used by DApps. BP also has priority participation rights for DApps that are interested in joining RYSEN, particularly those that have established a strong coin economic ecosystem.

6.2 BO (Block Observer)

In order to monitor whether BP is properly generating blocks and to detect any errors, RYSEN appoints BOs. Anyone can participate as a BO as long as they have the minimum block monitoring system required by RYSEN. BOs also receive a portion of the network usage fees based on the number of wallets used by the DApps.

6.3 CH (Coin Holder)

CH refers to a person who holds RYSEN coins, or DApp tokens. A coin holder can exercise voting rights to a specific person in proportion to the price of coins or tokens they hold. If a coin holder votes for a BO or BP, they can receive a portion of the network usage fees received by that BO or BP in proportion to their vote.

Coin holders also have the right to participate in a DApp that is entering the RYSEN ecosystem. They can stably participate in excellent DApps and redeem RYSEN coins at any time through the internal exchange. If a coin holder lacks information to participate directly or wishes to participate indirectly, they can delegate their participation rights to a specific BP. In this case, the delegated BP can participate in the DApp with the same amount of coins based on the proportion of participation in the DApp.

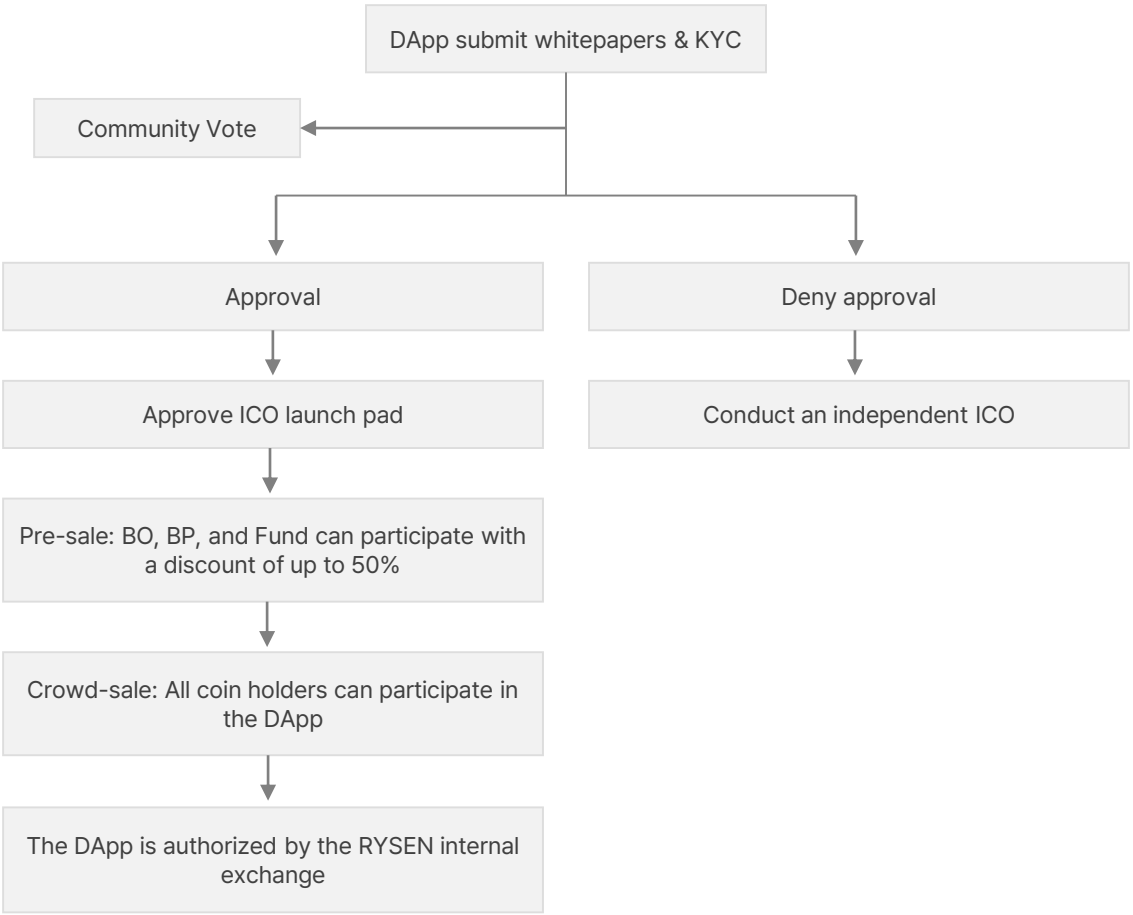
6.4 RYSEN Ecosystem

The RYSEN ecosystem consists of DApp developers, content creators, and a total of 30 billion coins, which is 30% of the total 100 billion coins. Coin holders vote to determine the popularity of a DApp. Based on the vote, BP, BO, and the ecosystem decide on DApp participation at a specific discount rate during the Pre-Sale stage. Moreover, RYSEN coin holders can participate in DApps individually during the Crowd-Sale stage.
The RYSEN ecosystem provides free airdrops and rewards for various RYSEN activities to RYSEN coin holders, as well as being used as participation funds for DApps.

Operating Method of RYSEN Ecosystem

- RYSEN will form a participation advisory committee led by BP to provide participation guidance.
- To sustain participation activities, RYSEN will partake in exceeding 20% of the ecosystem in a single DApp.
- RYSEN prioritizes the interests of the community and allow participation to DApps that can contribute best RYSEN ecosystem.
- The participation profit of RYSEN will be accumulated continuously in the ecosystem.

6.5 DApp Selection Process for RYSEN Mainnet



- DApps wishing to enter the RYSEN ecosystem submit their whitepapers, requested amount for participation, and other information to RYSEN. This information is stored on a smart contract and is made public on RYSEN for a month.
- RYSEN coin holders review the participation details and vote on whether to include the DApp in the RYSEN ecosystem. DApps that receive a certain amount of votes within a specified period are registered on the launchpad. Once registered, these DApps receive coin participation from the fund, BP, BO, and CH, and are listed on the internal exchange.
- RYSEN BP, BO, and the RYSEN Fund can participate in coin participation up to 50% off based on the participation details. However, they are limited to participating up to 50% of the requested amount.
- After this Community Pre-Sale phase ends, the Community Crowd-Sale is open for all CHs to participate in.
- Once coin participation is over, RYSEN launches the DApp's token on its internal exchange, allowing it to be traded with RYSEN.

6.6 The Advantages of RYSEN Mainnet for DApps

RYSEN's mainnet has a variety of detailed APIs secured for DApp service development, enabling a quick and cost-effective development. RYSEN engineers can also provide outsourcing support as needed, and APIs can be provided based on additional requests.

Using RYSEN's mainnet means that those who hold RYSEN coins have verified the business model, which allows external participants to perceive RYSEN as a very stable platform. Additionally, since coins are already being traded, a price range is established, which can allow for objective fundraising of additional coin investments.

When entering RYSEN, the screening process includes coin participation by RYSEN's fund and all members, which allows for initial funding.

6.7 Benefits for RYSEN Coin Holders

RYSEN's coin holders have the right to participate in DApps launching on RYSEN with favorable coin conditions. The tokens obtained through DApp participation can be exchanged with RYSEN or other DApp tokens on RYSEN's internal exchange at any time, providing good liquidity for coin investment funds.

RYSEN's coin holders can use their RYSEN or DApp tokens to vote for BP or BO, and share the rewards received by BP or BO. Coin holders can also receive free airdrops of DApp tokens or RYSEN from RYSEN Fund, depending on their DApp membership, referrals, and various activities.

6.8 Voting Rights within RYSEN

At RYSEN, the selection of BP, or the issuance of additional coins and the distribution of profits are voted based on the of assets held, including RYSEN coins and RYSEN coin-equivalent value of DApp tokens.

Therefore, the value of the total asset does not change when the RYSEN coin holder participates in the DApp. In the future, assets held will be reevaluated according to changes in the token price of the participating DApp.

As outstanding DApps grow in value, the value of their tokens will increase, which could naturally lead to changes in the voting order of BP based on changes in the asset holdings of RYSEN coin holders.

6.9 Inflation due to Additional Coin Issuance

When all coins in the Fund are exhausted in RYSEN, a vote is conducted to determine if 51% approval is obtained, 10% of the total coins will be issued and added to the Fund's holdings. In this case, the price of RYSEN coins may drop to 90.9% (=1/1.1) at the time of participation, instead of the time of issuance, as the Fund's holdings increase by 10%.

6.10 Coin Prices

When participating in DApp with the Fund, the selling pressure of RYSEN coins temporarily increases, which can negatively affect the price.

However, if the DApp grows, additional funding is provided, and since the funding for DApp is done with RYSEN, there is also a factor that increases the demand for RYSEN and raises the price. Additionally, many users require DApp tokens to use DApp services, which leads to an increased demand for RYSEN coins as they purchase them and exchange them on the internal exchange.

6.11 Cost of BP and BO system

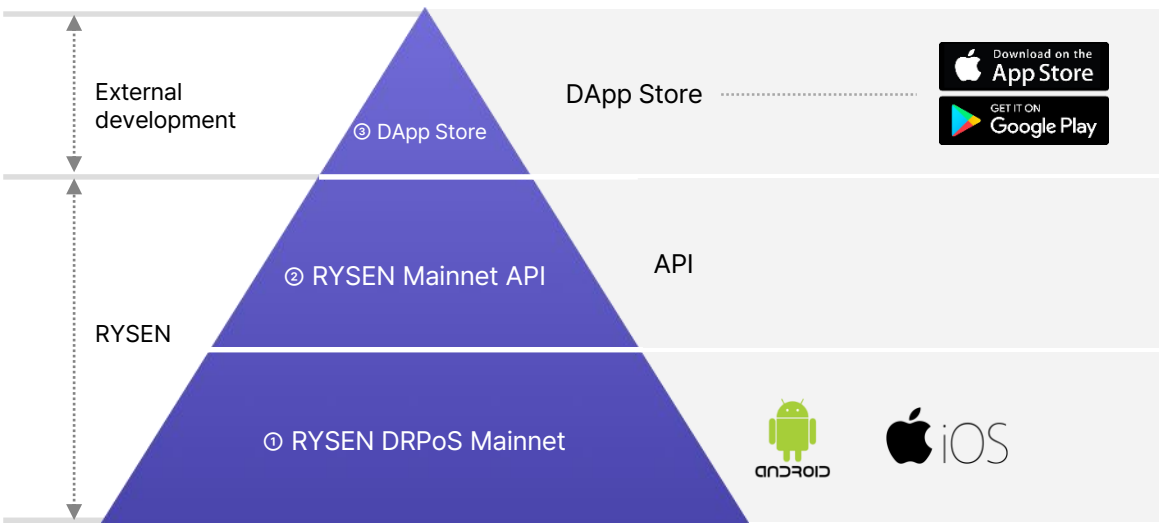
Node	CPU	RAM	HDD	N/W	Average Monthly Maintenance Cost
BP	16 core	128 G	1 T	1 T	1,356 USD
BO	2 core	8 G	128 G	100 M	119 USD

The total system maintenance cost is 1,356 USD per month for BP and approximately 119 USD per month for BO. Therefore, if BP and BO each use only one server, the basic cost of maintaining the entire system is as follows: for example, if there are 17 BPs and 100 BOs, the calculation would be (1,356 USD x 17 BPs) + (119 USD x 100 BOs) = 34,952 USD per month.

As the number of DApps entering the mainnet and the number of members in each DApp increase, the system maintenance cost will also increase.

07 SERVICE

7.1 RYSEN Mainnet Platform



<Figure1. Architecture of RYSEN solution>

The RYSEN platform architecture can be summarized into three layers.

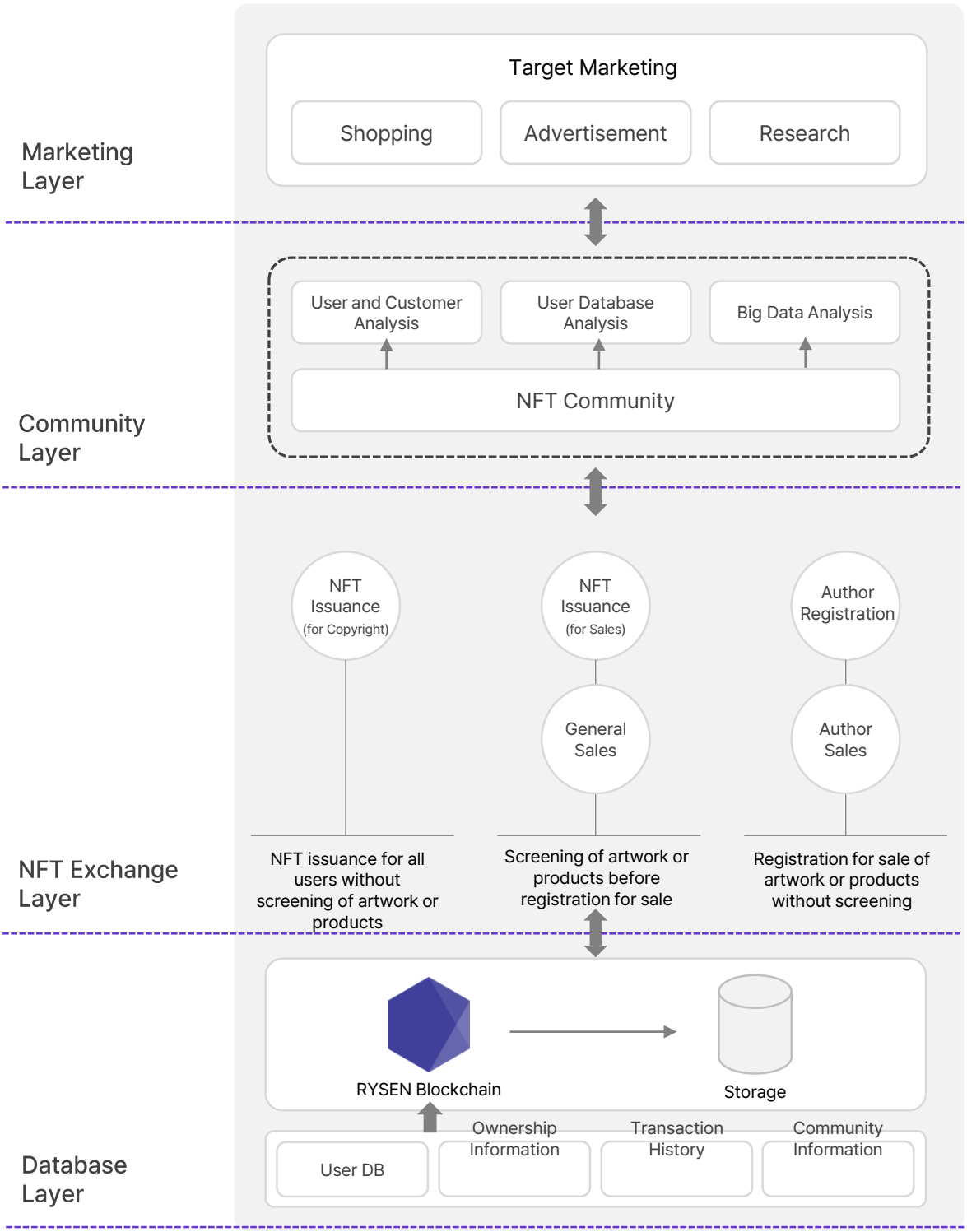
The first layer is the fundamental RYSEN blockchain mainnet based on DRPoS. This involves a method where a master node and randomly selected RYSEN nodes(BOs) work together to generate blocks in a random order to maintain the integrity of the entire blockchain.

The second layer is the middle layer, consisting of the mainnet API and common module API. In addition to the mainnet's own API, real-time video streaming, messenger, and P2P cloud service modules are provided as APIs enable DApps to speed up their service development. Furthermore, these common modules can be operated as a single Smart Contract to support other companies in developing them. Thus, outstanding DApps that are initially admitted can reduce development costs and time without additional costs or revenue sharing.

The third layer is the top layer, which contains the DApp store. This is where external developers mainly operate and create various 'DApps', which users can freely download and use. The selection of DApps that are admitted to the store are voted by BP, BO, and coin holders. To prevent bottlenecks in the existing mainnet network, the RYSEN mainnet provides an API to build an independent mainnet per each DApp, expected to have a significant initial traffic.

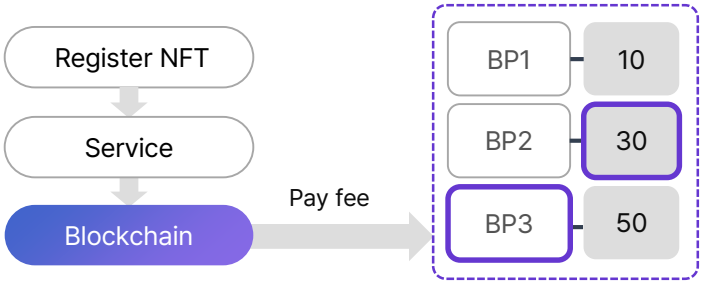
7.2 RYSEN NFT Exchange Platform

7.2.1 Structure of Platform



7.2.2 Features of RYSEN NFT Exchange

First, the fee for registering NFTs on the blockchain is paid based on the value set by the blockchain BP.



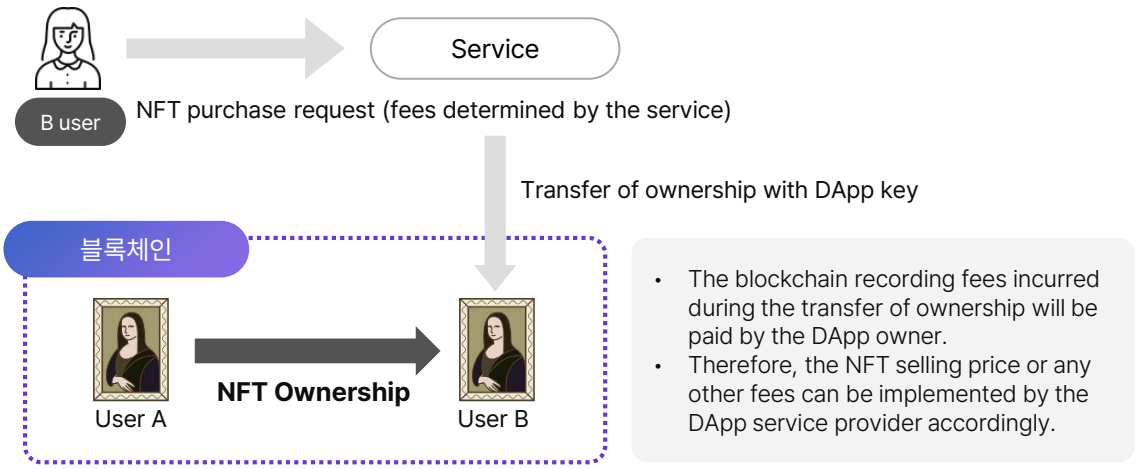
Fee

- The fee is determined every week based on the median value set by the BPs.
- The BP that creates the block containing the transaction receives the fee.
- The initial value is 0.

First NFT registrant > Pays a fee of 30 to BP3.

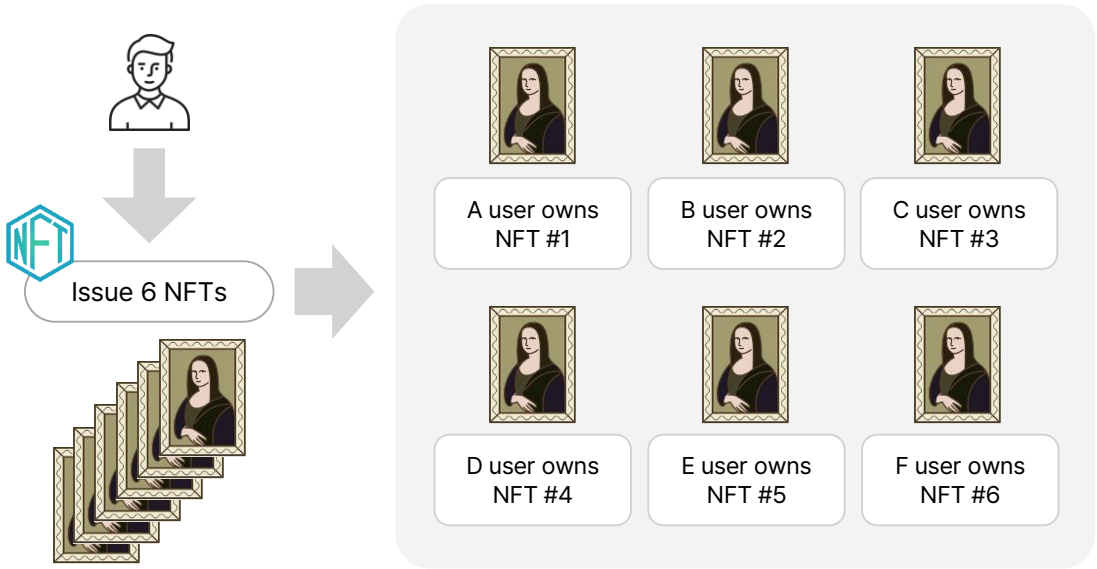
Secondly, the highest owner can trace the ownership history if there is a field of NFT registrants and owners.

Thirdly, DApp's private key is required for ownership transfer (approval from the DApp is required to transfer owndership.



- The blockchain recording fees incurred during the transfer of ownership will be paid by the DApp owner.
- Therefore, the NFT selling price or any other fees can be implemented by the DApp service provider accordingly.

Fourthly, registering multiple quantities of an item, instead of a single item, is possible. Each item is treated separately on the blockchain.



Fifth, the emergence of Non-Fungible Tokens(NFTs) has revolutionized the world of digital assets, offering unique opportunities for creators to monetize their digital creations. In addition, Artificial Intelligence(AI) technology is transforming the way we interact with technology, creating exciting new possibilities across various industries. As a leading blockchain platform, RYSEN carries potential to create innovative solutions that integrates both NFT and AI technology.

NFTs can be used to represent unique digital assets, such as artwork, music, or virtual real estate. On the other hand, AI technology can be used to extract valuable insights from the user data to be utilized in informing marketing strategies and business decisions.

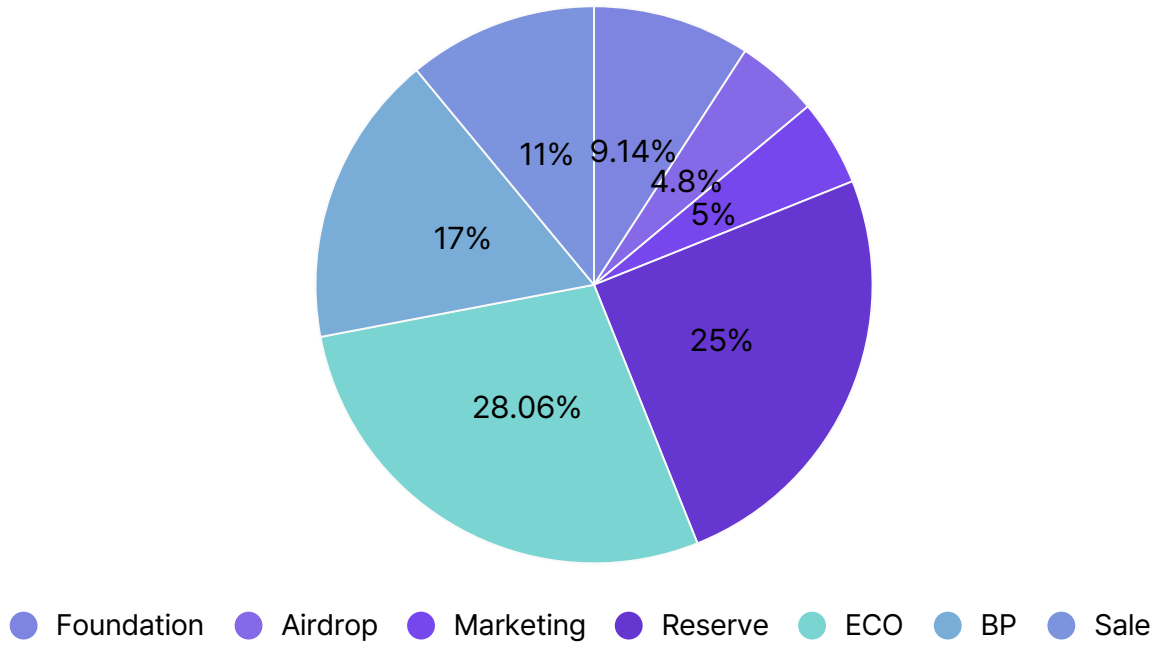
One example of such integration is creating NFTs generated by AI. These digital assets are unique and one-of-a-kind, as they are created by AI algorithms. This provides creators with new opportunities to monetize their digital creations and increases the value of the NFT market.

Another way to apply AI technology to analyze data in NFT transactions. This can provide valuable insights of user behavior, preferences, and market trends. These insights can be considered in forming marketing strategies and business decisions to improve the overall efficiency and effectiveness on the RYSEN blockchain.

08 COIN DISTRIBUTION STRUCTURE

8.1 Mining

- Symbol : RSN
- Total Issuance : 1,000,000,000 RSN



The following section outlines RYSEN's Token Distribution Model, designed with a focus on long-term network stability, sustainable growth, and a balanced incentive structure for all participants. The total token supply is capped at **1,000,000,000 RSN**, allocated across key categories to support continuous operations, ecosystem expansion, and network security, as illustrated in the chart above. This distribution framework is engineered to maintain equilibrium between network security, ecosystem development, user participation, and long-term sustainability, while also providing resilience against market volatility.

Ultimately, RYSEN's token economy issues only the level of supply required to support real network demand, reinforcing its role as a next-generation blockchain platform built for mainstream adoption. To further protect token value and mitigate downward price pressure, a **token burn mechanism** is incorporated into the model.

09 Roadmap & Governance

The RYSEN roadmap is not simply a list of scheduled feature releases—it is a strategic growth plan designed for RYSEN to become a Layer 1 that is actually used in real markets.

Most blockchain projects build their roadmaps around technical milestones alone, resulting in timelines that do not meaningfully connect to real market expansion or adoption.

In contrast, the RYSEN roadmap is structured around four core pillars:

1. Technology Development
2. Ecosystem Expansion
3. Business Partnerships
4. Sustainable Governance

Each phase is designed to organically connect the ecosystem in the order of technology → developers → users → enterprises → global infrastructure, ensuring that growth is cumulative rather than isolated.

2025 Q4

Launch of RYSEN Wallet & Mining Service

- Official release of RYSEN Wallet (Web/App)
- Account creation and recovery features
- Release of RYSEN Test Token
- Launch of RYSEN Mining (click-type) service
- Establishment of the community hub

09 Roadmap & Governance

2026 Q1

RYSEN Mainnet 1.0 Release

- Application of the base version of RYSEN Flux Consensus (RFC)
- Block production using the FV–RG structure
- Support for basic send/receive transactions
- Fundamental block validation and finality
- Integration of Wallet ↔ Mainnet

2026 Q2

Listing on Major Global Exchanges

- Listing on major global CEXs
- Execution of market-making strategy
- Conversion of mining rewards into main tokens
- Global campaign launched in celebration of listing

2026 Q3

Wallet 2.0 & Stabilization

- Basic bridge functionality (simple version)
- Display of mainnet status and block information
- Security updates (enhanced key-management module)
- Wallet and node performance tuning

09 Roadmap & Governance

2026 Q4

Ecosystem-Driven Expansion

- First wave of partnerships with 3–5 Web2 companies
- Community expansion into SEA / Middle East / India

2027 Q1

Smart Contract Testnet

- Execution of basic smart contracts
- Error logging and debugging support
- Automated testnet faucet

2027 Q2

Smart Contracts on Mainnet

- Contract execution UI added to the wallet
- First round of developer grants
- On-chain minting and signing features released

2027 Q3

Developer Tools & Service Layer Establishment

- Release of RYSEN SDK (JS/Python)
- Service APIs for payments, authentication, and data verification
- Release of Explorer 2.0
- Launch of RYSEN Gateway (Web2 → Web3 conversion tool)

09 Roadmap & Governance

2027 Q4

Expansion of Enterprise & Partner Network

- Integration with 5–10 gaming/content companies
- 2–3 PoCs for financial data systems
- Expansion of B2B partnerships
- Deployment of multiple mini-services built on RYSEN

2028 Q1

Preparation for Advanced Features

- Finalization of the Storage Fund architecture
- Prototype of the Node Score Model
- Base design for multi-chain functionality

2028 Q2

Integration of Expansion Features into Mainnet

- Official introduction of the Storage Fund system
- Beta version of the Multi-chain Bridge
- Application of advanced smart contract functions

09 Roadmap & Governance

2028 Q3

Beginning of RYSEN DAO Autonomous Governance

- DAO voting for core network parameters
- DAO-managed ecosystem fund
- Voting on inflation and reward policies
- Introduction of a DAO-based upgrade approval system

2028 Q4

Global Expansion Phase

- Integration with major games and web services
- POC in public, education, logistics, and data sectors

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