



# BLOCKCHAIN KALYCHAIN

2024 Whitepaper 2.0





**Motivation** is the catalyzing ingredient for every successful innovation.

## **COMPANY** **Kalychain Project**

Kalycoin was launched in 2020 on the Smart Chain Binance, the Kalychain Project helps to manage the general development, progress, and privileges of open source community projects through the development of good governance mechanisms. It is committed to the development and construction of the Kalychain Project and the advocacy and promotion of governance transparency to promote the safe and harmonious development of the project.

The design goals of the Kalychain Project governance structure mainly consider the sustainability of open source community projects, the effectiveness of management, and the safety of raised funds.

## KalyChain

KalyCoin is a cryptocurrency created by the Kalypay payment platform for usability in the real market to deal with a highly competitive digital financial ecosystem in the kalychain blockchain.

# Abstract

Abstract In a century in which economic, scientific-technical, cultural and political circumstances advance more than ever, it is necessary to apply the use of technologies that facilitate its development, so KalyChain proposes a blockchain technology infrastructure built with Hyperledger Besu enabled for the development of Smart contracts and Dapps with an IBFT 2.0 PoA consensus system that makes it highly competitive and secure without a high energy cost. Blockchain-enabled smart contracts employing PoA validation for transactions promise significant performance advantages over proof-of-work solutions. We discuss the advantages of the Kalychain utility compared to the Ethereum alternative and Kalychain's future smart contract development plans for the case applications industry.

## Keywords

- Smart contract, business network model, DAPP, information logistics, cross-organizational, peer-to-peer, distributed system, e-governance, Kalychain blockchain

## KalyChain

The development of a productive and sustainable blockchain is one of the pillars of the Kalychain project.

# 1. Introduction

Blockchain technology has revolutionized the world of finance, industry and other sectors by providing a secure and transparent way to store and transfer digital information. Hyperledger Besu is an enterprise blockchain platform that has been developed to meet the needs of businesses and organizations that want to implement blockchain solutions.

This whitepaper will focus on a blockchain based on Hyperledger Besu, which offers a variety of advantages compared to other blockchain solutions. In particular, we will discuss how the combination of Istanbul Byzantine Fault Tolerance (IBFT) 2.0 and Besu's Proof of Authority (PoA) algorithm enables greater efficiency and scalability for enterprise applications.

In this paper, we will also explore how this blockchain can help businesses improve the security and transparency of their operations, as well as reduce costs and increase efficiency. In addition, we will address the technical and operational considerations for the implementation of a Hyperledger Besu based blockchain, including hardware and software requirements, IBFT 2.0 PoA consensus system configuration, and node management.

Overall, this whitepaper will provide a detailed overview of how a Hyperledger Besu-based blockchain can be a valuable solution for businesses and organizations looking to implement secure and efficient blockchain solutions.



*“Creativity is the power to connect the seemingly disconnected”*  
William Plumber



### Search & Development Performance

Unlike Bitcoins, many smart contract systems are equipped with the Turing-complete Solidity language that resembles JavaScript syntax and targets for enactment, for example, the Virtual Ethereum machine [44]. Ethereum is the de facto leading smart contract system despite being riddled with several shortcomings.

The latter initially find application in various domains such as, for example, financial technology, Internet of Things (IoT) applications, digital signage solutions.

An essential aspect of smart contracts is a decentralized validation of transactions, initially using the so-called proof of work (PoW). The core technology that enables smart contracts is a distributed public ledger called the blockchain, which records transaction events without requiring a trusted central authority. Blockchain technology spreads in popularity with the inception of Bitcoin, a peer-to-peer (P2P) payment and cryptocurrency system comprising a limited set of operations at the protocol layer. Bitcoins use PoW for transaction validation which is computationally expensive and electricity-intensive.

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*“Everyone wants to live on top of the mountain, but all the happiness and growth occurs while you’re climbing it.”*

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The amount of technology in buildings and homes is rapidly growing and changing. The most significant

## 2. Introducing KalyChain

KalyChain is an EVM-compatible blockchain that aims to complement the original KalyCoin token, which is hosted on the binance network, however due to the needs of our users and the market in general KalyCoin has changed to a new approach in which it will go from being a BEP20 token to a PoS consensus system blockchain. compatible with EVM for better interaction with the technological and financial ecosystem, as well as becoming KalyPay's main payment gateway. As a proof-of-stake blockchain, KalyChain seeks to bring scalability, security, robustness, and utility to the KalyPay ecosystem. It is important to note that the KalyChain project is a blockchain that prioritizes the community and its investors, prioritizing continuous improvement and application development within the KalyChain ecosystem. Ultimately, KalyChain will provide KalyCoin users with access to an ever-growing DeFi ecosystem promoted by the KALYSSY group, which will feature blockchain-oriented software development courses on EVM-compatible chains such as KalyChain. KalyChain is focused on the development of financial applications and solutions applying blockchain technology to both private companies and the general public.

## 2.1 Features of KalyChain

KalyChain IBFT 2.0 PoA is an enterprise blockchain that combines the Istanbul Byzantine Fault Tolerance (IBFT) 2.0 consensus algorithm with the Proof of Authority (PoA) algorithm to provide a secure and scalable platform for enterprise applications. Some of the most important features of KalyChain IBFT 2.0 PoA include:

**Efficiency and scalability:** The IBFT 2.0 PoA consensus system allows for high efficiency and scalability compared to other consensus systems such as Proof of Work (PoW) and Proof of Stake (PoS).

**Enhanced Security:** IBFT 2.0 uses a voting consensus technique in which all participating nodes must approve a transaction before it is added to the blockchain record. This improves the security and integrity of the blockchain.

**Enterprise Support:** KalyChain is an enterprise blockchain platform that has been developed to meet the needs of businesses and organizations that want to implement solutions using blockchain technology.

**Proof of Authority (PoA):** Instead of relying on computational power, Besu's PoA algorithm uses authority to validate transactions. Validators are selected by network nodes, reducing the risk of attacks by 51%.

**KalyChain interoperability:** IBFT 2.0 PoA easily integrates with other blockchain technologies and can work in conjunction with other EVM and Hyperledger projects.

Overall, KalyChain IBFT 2.0 PoA is a secure, efficient, and scalable enterprise blockchain that has been designed to meet the needs of businesses and organizations looking to implement high-quality blockchain solutions.

## 2.2 Main features of Hyperledger Besu IBFT 2.0

KalyChain is an enterprise blockchain platform based on Ethereum technology that offers a number of unique and valuable features for businesses and organizations that want to implement blockchain solutions. Below are some of the main and most important features of Hyperledger Besu 2.0:

**Compatibility:** KalyChain supports the Ethereum mainnet, which means it can run Ethereum decentralized applications (dApps) and smart contracts. In addition, it also supports multiple consensus mechanisms, allowing users to choose from different consensus algorithms according to their needs.

**Privacy:** KalyChain offers enhanced privacy and confidentiality functionality through the integration of technologies such as Quorum and Nightfall. In addition, the platform also supports private networking and integration with enterprise privacy solutions such as Intel SGX.

**Security:** KalyChain is a highly secure blockchain platform, with a wide range of security functionalities including protection against DDoS attacks, verification of cryptographic signatures, and validation of identities and certificates. In addition, the platform also undergoes regular and rigorous security testing to ensure the protection of assets and information.

**Integration:** KalyChain easily integrates with other enterprise solutions, allowing companies to create blockchain solutions that integrate seamlessly with their existing systems. The platform supports a wide range of programming languages and frameworks, making it highly adaptable and customizable.



# 3. KalyChain Architecture

KalyChain's architecture is comprised of several layers and interconnected components that work together to provide a scalable and reliable enterprise blockchain platform. The following describes the main layers and components of the KalyChain architecture:

**Application layer:** This layer contains the applications and smart contracts running on the KalyChain blockchain network. These applications can be developed in a variety of programming languages, including Solidity and Java. The application layer also includes an API that allows developers to interact with the blockchain network.

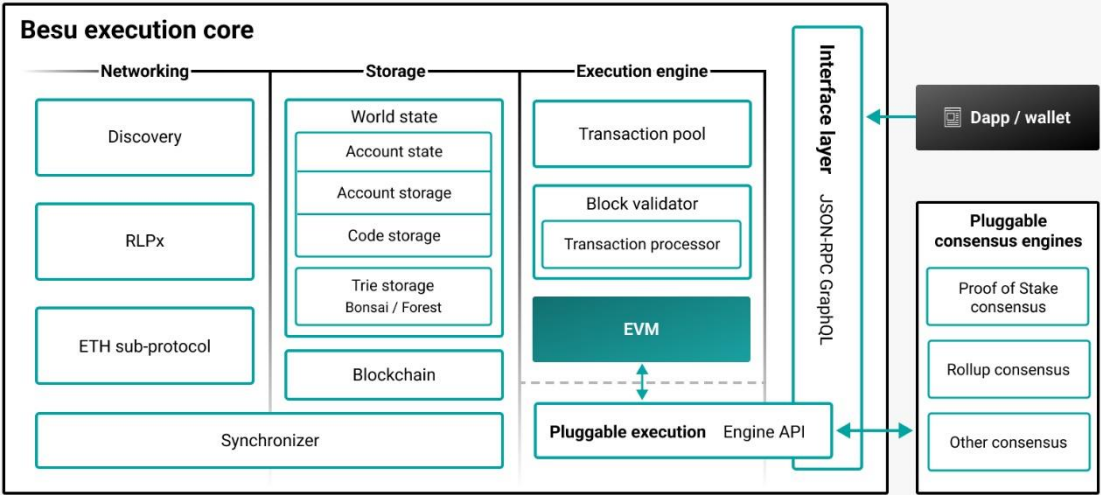
**Smart Contract Layer:** This layer provides the smart contract execution engine and EVM (Ethereum Virtual Machine) execution environment. Smart contracts run on KalyChain's blockchain network and can interact with other applications and smart contracts.

**Consensus layer:** This layer is responsible for ensuring that all nodes in the KalyChain blockchain network are synchronized and agree on the current state of the blockchain. KalyChain uses the IBFT 2.0 PoA consensus algorithm to ensure network trust and scalability.

**Network layer:** This layer provides the communication infrastructure needed for nodes in the KalyChain blockchain network to communicate with each other and exchange information for each other. KalyChain uses the P2P (peer-to-peer) network protocol to allow nodes to communicate securely and efficiently.

**Storage layer:** This layer stores blockchain data, including blocks, transactions, and current state of the chain. KalyChain uses a key-value database to store this data, allowing for high read and write speed.

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## 3.1 KalyChain Native Currency: The \$KLC Coin

KalyChain introduces a native cryptocurrency: the KalyChain coin (\$KLC). This community-centric token serves as a primary governance token for the KalyChain blockchain and comes with several use cases. Being the native currency of the chain, it will be used to pay the fees for operations in the network, as is ETH in the Ethereum network.

It is worth noting that all 51% of the maximum \$KLC coin supply will be mined at the start of the mainnet launch.

## 3.2 KalyChain Configurations

- An IBFT 2.0 PoA with built-in system contracts will be used as a core consensus algorithm by KalyChain.
- The average block time is expected to be 2 seconds.
- The network will be able to support a maximum of 25 nodes authorized as validators in the network to ensure its performance and stability.
- It is possible to be a validator of the KalyChain network, you can make a request to the KalyChain team and community for a value of 10,000,000 KLC, although collecting this amount of coins is not everything since once it is approved by the community and other validators you can join the set of validators.
- If the block is not produced or is not accepted within the scheduled time, the next validator would assume the functions of the proposer.
- There is an initial reward of 2.5 KLC per block of which one Halving will occur every 4,576,000 blocks.
- All transaction fees will have a value of \$KLC.

# 4. Potential applications on top of KalyChain

A Hyperledger Besu-based blockchain can be used for a wide range of applications and enterprise use cases. Here are some of the possibilities:

## **Identity and supply chain management**

KalyChain can be used for digital identity management and online authentication. This is especially useful in sectors such as finance, where identity verification is crucial. In addition, KalyChain can be used for supply chain management, allowing traceability and transparency at all stages of the process.

## **DeFi**

As an EVM-compatible blockchain, DeFi protocols such as Uniswap and SushiSwap can be seamlessly integrated with KalyChain. \$KLC is a DeFi-capable cryptocurrency that can be locked into various liquidity pools and provide rewards to their holders. In addition, several Layer 2 solutions found within the Polygon Edge architecture (including ZK Rollups and Optimistic Rollups) will allow KalyChain to make improvements to its existing transaction speeds in DeFi and address some privacy concerns.

## **GameFi**

KalyChain will provide developers with the ability to build entire virtual worlds and blockchain games within KalyChain's smart contract framework. As a result, the \$KLC cryptocurrency will allow users to participate in virtual gaming economies and share digital resources on their favorite metaverses.

## **NFT**

KalyChain will provide its users with the ability to publish their own NFTs following the ERC721 protocol. Since this proven NFT standard is widely accepted by markets and metaverses, KalyChain NFT owners will be able to integrate their NFT into the existing NFT landscape.

# 5. System requirements

**Java Virtual Machine size** For Mainnet and testnets, the minimum Java Virtual Machine (JVM) memory requirement is 8 GB. JVM memory requirements are highest when syncing but will reduce after the node is synchronized to the chain head. Monitor your system to determine your current JVM memory needs.

**Disk space** Fast synchronization with pruning enabled requires approximately 750 GB of disk space. Full synchronization requires approximately 3 TB.

**Disk type** Use local SSD storage for high throughput nodes (validators and RPC nodes). Read-only nodes can use a lower performance setup.

You can use local SSDs through SCSI interfaces. For higher performance in production settings, we recommend upgrading to NVMe interfaces.

## 6. Chain-cloud integration

The development of the blockchain to this day still does not depart from the logic of Bitcoin's block-by-time plus global synchronization verification. This is not a big problem for the use of low-interaction actions such as value transfers, but it may not be the best for application platforms. It can be seen that some simple small games can block Ethereum, EOS and other platforms, so in large-scale commercial applications, the existing public blockchain platform is inadequate. The Kalychain team believes that the most important feature that blockchain brings to applications is not "decentralization", but rather the following three "blockchain features":

- "Four in one" authority management mechanism for accounts, addresses, funds, and identities
- Comes with a natural clearing and settlement network
- High-speed growth brought by incentives and liquidity.

These are the features that are lacking in all existing Internet applications. Most of the existing Internet applications are deployed on the cloud, and in the foreseeable future, applications deployed on the cloud will remain mainstream. The Kalychain team believes that the fusion of the above-mentioned blockchain characteristics with applications deployed on the cloud will generate new application forms and promote the true adoption of blockchain.

# 7. KALYCHAIN PROJECT

## GOVERNANCE STRUCTURE

The Kalychain Project governance structure includes operational procedures and rules for daily work and special situations. The organization structure of the Kalychain Project is as follow:

## MEET OUR CREATIVE TEAM

The Kalychain Project governance structure includes operational procedures and rules for daily work and special situations. The organization structure of the Kalychain Project is as follows:



### Abdoulaye

CEO Kalyssi  
Responsible for the overall operation of the company and reports to the Board of Directors. Sets the company's strategic vision and is responsible for its execution.



### Rafael

CTO Kalyssi  
Responsible for the technical direction of a company. Oversee the technology team and make sure that the products and services the company offers are using the latest and most efficient technology.



### Hien

COO Kalyssi  
Ensure that the daily operation of the company is being carried out in the most efficient and effective way possible. Coordinate and supervise all departments of the company.



### Agre

CFO Kalyssi  
Responsible for planning, coordinating and controlling all activities related to the economic-financial management of the company.



## Boubacar

Legal Manager Kalyssi  
Responsible for the management and administration of legal department. They also provide advice and guidance on legal matters to senior managers and directors.



## Gbamou

Advisor Kalyssi  
Provide support in planning, finance, marketing, and advising organization officials on the appropriateness and overall merits of policies and activities



## Andrzej

Blockchain Developer  
Development of smart contracts and DApps within the Kalychain network, in addition to offering long-term sustainable solutions without neglecting network security, prepared for a highly competitive ecosystem.



## Manda S.

Web & Mobile Development  
In charge of web development and mobile applications of Kalychain blockchain.

## 8. Economic Model

The maximum supply is 7 billion coins, and 3.570.000.000 million coins were initially pre-mined (51%).

To protect the interests of investors and ensure the long-term healthy operation of the project, in addition to the regulations on the use of KalyChains, the Kalychain Project will allocate its coins to the following areas:



- 01 Private y Public Sale
- 02 Founding Team and Development Team
- 03 Private Investors
- 04 Business Development
- 05 Academic Research, Education

KalyChain will carry out public and private sales to collect part of the initial capital for the medium-term development of the project, a part of the income will be destined to the founding team and development team while during the process a part of the circulating coins will be granted to investors. private.

Throughout the existence of KalyChain, a part of the funds will be allocated to research and promote the development of applications in the block chain by the community with academic aid and courses taught by Kalychain developers, which will allow growth appropriate within the industry.



# 9. Road Map



## 2021-I Initial Launch Phase (Token Sale)

Private and Public Sale of KLC (on BEP-20)

- ✓ Launch of the \$KLC token on Binance Smart Chain (BEP-20).
- ✓ Successful private and public sale to raise funds for initial development.
- ✓ Objective achieved: Raise funds to prepare for the migration to an independent blockchain (KalyChain).



## 2021-II

Initial Infrastructure Creation

- ✓ Formation of the development team.
- ✓ Initial development of KalyChain and early research into blockchain infrastructure.



## 2022-I

Development and Migration Preparation

- ✓ Completion of KalyChain Development (PoSA)
  - Development of the KalyChain blockchain using Proof of Stake Authority (PoSA) consensus.
- ✓ Testnet Launch and Progressive Migration
  - Launch of KalyChain testnet.
  - Initial migration phase of services to KalyChain blockchain.



## 2022-II

KalyChain Tools Preparation

- ✓ Development of KalyScan (blockchain explorer) for tracking transactions on KalyChain.
- ✓ Design and development of KalyBridge, a solution for connecting KalyChain with other blockchains.



## 2023-I

Full Migration to KalyChain Mainnet

- ✓ Complete migration of KLC tokens from BEP-20 to the KalyChain blockchain.
- ✓ Launch of KalyChain Mainnet as an independent blockchain.



## 2023-II

Launch of KalyBridge and Kalyswap

- ✓ Deployment of KalyBridge, enabling cross-chain swaps.
- ✓ Official launch of Kalyswap, KalyChain's native decentralized exchange.



### 2023-III

#### Introduction of KalyScan

- ✓ Launch of KalyScan, a blockchain explorer for tracking transactions, blocks, and smart contracts on KalyChain.
- ✓ Listing of KLC (KRC20) on WhiteBit
  - First listing of \$KLC token (KRC20 format) on WhiteBit exchange.



### 2024-I

#### Infrastructure Development and New Products

- ✓ KalyBridge V2 Update
  - Upgrades to KalyBridge for enhanced interoperability and faster transaction times.
- ✓ Kalypad (Decentralized IDO Platform) Launch
  - Launch of Kalypad, a platform for decentralized Initial DEX Offerings (IDO) on KalyChain.



### 2024-II

#### Kalyswap Expansion

- ✓ Launch of new features on Kalyswap, including staking pools and liquidity farming.



### 2025-I

#### Launch of Khepri Wallet and Kalycloud

- ✓ Khepri Wallet (Web3) Launch
  - Launch of Khepri Wallet, a decentralized Web3 wallet allowing users to securely manage their digital assets on KalyChain.
- ✓ Kalycloud Launch
  - Launch of Kalycloud, an innovative cloud-based validation system reducing hardware needs for validators while enhancing security and efficiency.



### 2025-II

#### Additional Listings & Governance Upgrade

- ✓ KLC (KRC20) Listings on MEXC and Gate.io
  - Listing of KLC on MEXC and Gate.io to increase token visibility and accessibility.
- ✓ Strengthening of Governance
  - Introduction of early community governance structures to prepare for decentralized governance.



### 2026-I

#### Development of Zurigram and New Features

- ✓ Zurigram Launch
  - Zurigram, a decentralized and secure messaging platform, will be launched on KalyChain to offer private communication solutions powered by blockchain technology.
- ✓ KalyBridge V3 Launch
  - Enhancement of KalyBridge to support more blockchains with increased security and faster transactions.



**2026-II**

**Additional KLC Listings and Community Governance**

- ✓ Listing of KLC on HTX and Bitfinex, further expanding the token's global reach.
- ✓ Implementation of Decentralized Community Governance (DAO)
  - Development of a Decentralized Autonomous Organization (DAO), enabling the KalyChain community to participate in decisions regarding blockchain evolution.



**2027-I**

**Establishment of the KalyChain Foundation**

- ✓ Establishment of the KalyChain Foundation
  - Official creation of the KalyChain Foundation to oversee the future of the blockchain, promote transparency, and support widespread adoption.



**2027-II**

**Full Community Governance and Listing Proposals via DAO**

- ✓ Governance Token (KGT) holders will play a crucial role in KalyChain governance through the DAO, including the power to propose and vote on additional KLC listings on new exchanges in 2027.



**2027-III**

**Massive KalyChain Adoption**

- ✓ Integration of KalyChain into sectors like decentralized finance (DeFi), NFTs, and Web3 applications.
- ✓ Expansion of strategic partnerships with enterprises and institutions to foster global adoption.



**2028**

**Main focus on continuous improvement according to market needs this year**



**2029**

**Stay tuned!**



The adoption of proof of authority in Kalychain constitutes a considerable saving of computational effort over the proof of work.


Also the use of unspent transaction outputs is more scalable compared to Ethereum account management. In combination with simple payment verification,

The value transfer protocol for information logistics at Kalychain comprises a business network model for choreographing several collaborating organizations. The latter can provide services with on-premises contracts that must match the specified runtime behavior of the service type process views in the enterprise network model. With a multi-layered smart contract management layer, collaborating parties protect the privacy of their trade secrets that represent a competitive advantage by hiding extension steps in local contracts.payment verification.

## 10. CONCLUSIONS

This whitepaper introduces the Kalychain framework for a smart contract blockchain technology solution, We show Kalychain's specific implementation of transaction processing that uses proof-of-stake validation. In addition, Kalychain integrates the Ethereum virtual machine (EVM) along with Bitcoin's unspent transaction outgoing protocol. Please note that Kalychain EVM is still consistently backward compatible

- In addition, Kalychain's framework recognises that smart contract lifecycle management is important to support proper security research by collaborating parties. To support Kalychain's lifecycle management, the current lingua franca Solidity lacks suitability. Consequently, Kalychain's emerging framework requires a new smart contract language with an improved utility.
- While the non-scalable Ethereum solution does not allow for mobile solutions, Kalychain aims to achieve democratized proof of authority transaction validation with its mobile strategy. The Kalychain framework has a clear understanding of the quality criteria that future developments must satisfy. Regarding functional requirements, Kalychain plans to develop an application layer for smart contract lifecycle management. Most importantly, such lifecycle management is important for investigating collaborating parties to reduce security breaches such as those Ethereum recently experienced, resulting in multiple hardforks of the latter.



In summary, the Kalychain framework recognizes that smart contracts are sociotechnical artifacts that must also take into account the quality requirements essential to achieve widespread adoption by users. Continuous real-life industry projects with Kalychain applications result in a continuous collection of empirical requirements. Still, Kalychain also recognizes that smart contract lifecycle management requires the development of application layers with a sophisticated front-end user experience that current solutions don't pay enough attention to.

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