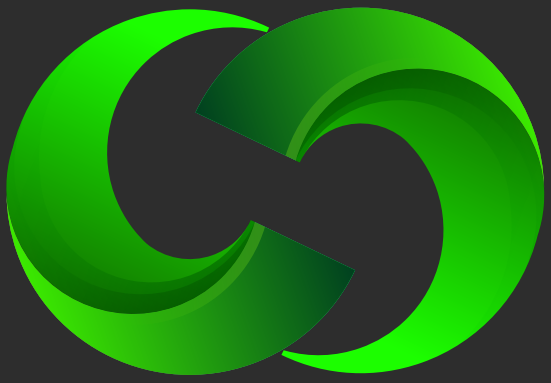

BBACHAIN

WHITEPAPER

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ABSTRACT

BBACHAIN is a cutting-edge blockchain platform that incorporates the latest technological advancements from the blockchain community. Our primary objective is to revolutionize the blockchain landscape by providing a platform that offers exceptional transaction speed, high transaction volume, low transaction costs, and unparalleled transaction anonymity for all users.

INTRODUCTION

The BBACHAIN is a next level blockchain platform that has implemented the groundbreaking Traces of Times algorithm, which is an enhanced version of the Proof of History (PoH) algorithm. This algorithm has been specifically engineered to facilitate faster transaction speeds and accommodate larger transaction volumes compared to traditional blockchain technologies. By leveraging time as a crucial factor, our platform ensures unparalleled efficiency and swiftness in executing transactions.

One of our keys focuses is reducing transaction costs for our users. We recognize the challenges faced by previous blockchain systems, where surges in transaction volume led to exorbitant transaction fees for users. At BBACHAIN, we are committed to making transaction costs affordable, enabling users to send transactions on our platform without incurring prohibitive expenses.

We prioritize absolute transaction anonymity for all users since we understand the significance of safeguarding user privacy and preventing any potential exploitation or misuse of transaction data. As such, our platform ensures complete privacy for all transactions, rendering them entirely untraceable to individual users. This robust privacy feature empowers our users to maintain their confidentiality and protect their personal information.

The creation of BBACHAIN is driven by our vision to offer a blockchain platform that excels in transaction speed, transaction volume, transaction cost efficiency, and transaction anonymity. Through our innovative Traces of Times algorithm and unwavering commitment to user privacy, we aim to redefine the possibilities of blockchain technology and provide a seamless experience for our users.

1. CONCEPT

BBACHAIN is a cutting-edge blockchain platform that incorporates the latest technological advancements from the blockchain community. Our primary objective is to revolutionize the blockchain landscape by providing a platform that offers exceptional transaction speed, high transaction volume, low transaction costs, and unparalleled transaction anonymity for all users.

1.1.Consensus

Consensus lies at the core of blockchain technology, enabling a decentralized network of participants to unanimously agree on a single version of a shared digital history, all without the need for a central authority. In simple terms, consensus refers to the collective agreement among network participants regarding the current state of the blockchain ledger, which is a comprehensive record of all network transactions.

Maintaining consensus is of utmost importance as it ensures the tamper-proof nature, security, and transparency of the blockchain. By preventing fraud, double-spending, and other malicious activities, the consensus mechanism safeguards the integrity of the entire network. It guarantees that all participants have a mutual understanding of the blockchain's current state and mandates consensus for any modifications to the ledger.

Various consensus algorithms exist within the realm of blockchain technology, each with its own strengths and weaknesses. The original consensus algorithm, Proof of Work (PoW), relies on solving complex mathematical problems to validate transactions and add new blocks to the blockchain. Proof of Stake (PoS), on the other hand, leverages staking to validate transactions and generate new blocks. Proof of Stake (PoS) entrusts a limited number of trusted nodes with transaction validation and block addition. Meanwhile, Practical Byzantine Fault Tolerance (PBFT) mandates a voting process for network participants to achieve agreement on the blockchain's state.
The selection of a consensus algorithm depends on the specific requirements of a blockchain network. PoW, known for its high level of security and decentralization, finds common applications in public blockchains. Conversely, PoS often caters to private blockchains seeking enhanced speed and efficiency. PoS excels in blockchains necessitating rapid transaction speeds and scalability. PBFT, with its emphasis on fault tolerance and consensus among network participants, is frequently employed in permitted blockchains.

So, the consensus represents a vital pillar of blockchain technology, ensuring the integrity, security, and transparency of the blockchain ledger. The choice of a consensus algorithm is dictated by the distinct needs of a particular blockchain network, considering factors such as security, decentralization, speed, efficiency, scalability, and fault tolerance.

1.2. Merkle Trees

A Merkle tree serves as a fundamental data structure in blockchain technology, enabling efficient and secure summarization and verification of large volumes of data, such as transactions within a block. It accomplishes this by using hashes of different data blocks, where each hash represents a concise summary of the data contained within that block.

The structure of a Merkle tree is hierarchical, with individual data blocks positioned at the bottom of the tree and the summary hash of all blocks located at the top, referred to as the Merkle root. Construction of the tree involves recursively hashing pairs of child nodes until only a single hash remains at the top, representing the Merkle root.

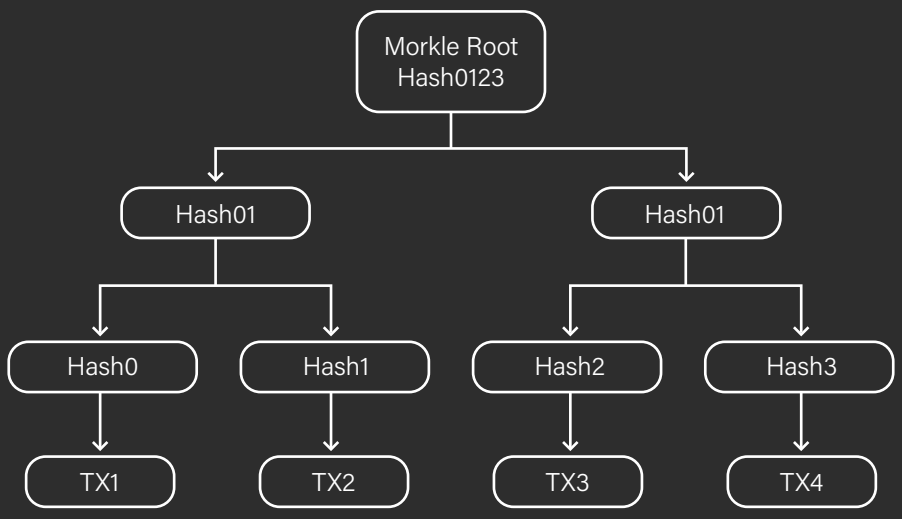

Figure 1: Sample diagram of a Merkle tree

The use of a Merkle tree offers several benefits for the verification of extensive data sets. Rather than needing to verify each individual block of data, the process is streamlined by solely validating the summary hash at the root of the tree. This approach significantly enhances the speed and efficiency of the verification process. Furthermore, the implementation of hashes within the Merkle tree ensures data security, as any alterations to the data would result in a distinct hash value and, consequently, a different Merkle root.

Besides efficient verification, the Merkle tree aids in confirming the consistency of the data. By comparing the Merkle root of one data version with another, it becomes possible to detect any modifications made to the data. This capability plays a crucial role in upholding the integrity of the blockchain ledger, effectively mitigating fraudulent activities.

Hence, the Merkle tree is a powerful mathematical data structure employed within blockchain technology. It facilitates the efficient and secure summarization and verification of extensive data, such as block transactions. By enabling swift verification, ensuring data security, and supporting consistency checks, the Merkle tree serves as a vital component in maintaining the integrity and reliability of blockchain systems.

1.3. Proof of Stake

Proof of Stake (PoS) serves as a consensus mechanism utilized in various blockchain systems, including BBACHAIN, as a compelling alternative to Proof of Work (PoW). Within PoS, the creation and validation of new blocks are entrusted to validators selected based on the number of tokens they possess and are willing to "stake" or lock up as collateral.

In PoS, validators are designated to forge new blocks in proportion to their stake or the amount of cryptocurrency held in their wallet. The likelihood of being chosen as a validator increases with the amount of tokens possessed. Once selected, validators assume the responsibility of verifying transactions and generating new blocks. In return for their contributions, validators receive transaction fees and a portion of newly minted tokens as rewards.

An essential advantage of PoS lies in its superior energy efficiency and eco-friendliness compared to PoW, which demands substantial computational power to solve intricate mathematical problems. Moreover, PoS offers a more scalable solution by removing transaction processing limitations imposed by the computational capabilities of the network.

To ensure the security and integrity of the blockchain network, PoS incentivizes validators to act honestly. Any malicious actions or attempts to manipulate the network can lead to the forfeiture of their staked tokens as penalties. This penalty mechanism acts as a powerful deterrent,motivating validators to abide by the established rules and act in the best interest of the network as a whole.

In summary, PoS stands as a consensus mechanism utilized in blockchain systems, including BBACHAIN, whereby validators are chosen based on the number of tokens they possess and are willing to stake. PoS offers an energy-efficient and scalable alternative to the system, while upholding network security and integrity by incentivizing validators to act with honesty and integrity.

2. ARCHITECTURE

2.1. Native Token (BBA)

Within the context of BBACHAIN, a native token represents a specific type of cryptocurrency exclusively issued and utilized on the BBACHAIN blockchain network. BBA stands as the native token of BBACHAIN, playing a pivotal role in various aspects within the network.

- Means of Payment: BBA serves as a medium of exchange, allowing users to make payments for goods and services offered within the BBACHAIN ecosystem. It enables direct peer-to-peer transactions without requiring intermediaries like banks or payment processors.
- Reward System: BBA acts as a reward mechanism for users who contribute to the network through activities such as staking or validation. Validators receive BBA tokens as rewards for processing transactions and upholding the network's security.
- Access to Services: Certain features and services within the BBACHAIN ecosystem are accessible exclusively through the use of BBA tokens. For instance, users may need to hold a specific quantity of BBA tokens to participate in particular activities or gain access to premium features.

Native tokens, including BBA, have a fixed supply, meaning there is a limited number of tokens in circulation. This scarcity can generate demand for the token and contribute to its value. Users have the ability to buy, sell, or trade BBA tokens on cryptocurrency exchanges, similar to any other form of cryptocurrency.

BBA serves as the native token of the BBACHAIN blockchain network, fulfilling various roles such as facilitating payments, rewarding network contributors, enabling access to specific services, and driving participation through staking and validation activities.

2.2. Dalton Unit

The Dalton, also known as the unified atomic mass unit (u or Da), serves as a widely adopted unit of mass in the realms of physics and chemistry. It is defined as 1/12th of the mass of a neutral atom of carbon-12 in its ground state, approximately equivalent to 1.66054 x 10^(-27) kilograms.

In the context of BBACHAIN, the Dalton finds utility as a unit of account for measuring the value of transactions within the network. Additionally, transaction fees on the BBACHAIN platform are denominated in Dalton. Consequently, users are required to pay a specific amount of Dalton to have their transactions processed and added to the blockchain.

By utilizing the Dalton as a unit of account, BBACHAIN effectively establishes scarcity within the network. The total supply of Dalton tokens remains fixed, indicating a finite availability of tokens. Consequently, as demand for Dalton grows, its value has the potential to increase over time.

Moreover, BBACHAIN employs the Dalton as an incentive mechanism to encourage user participation in its consensus mechanism. Validators who actively contribute to the network through staking and validating transactions receive Dalton tokens as a form of compensation.

Hence, the Dalton plays a crucial role within BBACHAIN. It functions as a unit of account for transaction valuation and payment of transaction fees. Moreover, the use of Dalton establishes scarcity within the network and provides incentives for users to engage in the consensus mechanism

2.3. Inflation and Supply

BBACHAIN, an innovative blockchain platform, operates with an initial supply of 50 million BBA tokens. To incentivize validators and reward their participation, a formula is used to calculate the initial rewards based on the number of years spent on the blockchain. This formula is defined as follows:

Initialization Reward = 200,000 BBA

$$\text{Rewards} = \text{Initialization Reward} \times \left(\frac{1}{2^{\text{year}}}\right)$$

Let's examine how the rewards are calculated for the first three years as examples:

Year 1 : Rewards $= 200{,}000 \times \left(\frac{1}{2^0}\right)$

$= 200{,}000$ BBA

Year 2 : Rewards $= 200{,}000 \times \left(\frac{1}{2^1}\right)$

$= 100{,}000$ BBA

Year 3 : Rewards $= 200{,}000 \times \left(\frac{1}{2^2}\right)$

$= 50{,}000$ BBA

In addition to the initial rewards, BBACHAIN implements a fixed yearly inflation of 1 million BBA tokens that are allocated to validators. This ensures a steady and continuous supply of rewards to incentivize validators to actively participate and contribute to the stability of the network. So, the increment of the total supply per year can be represented as below,

Supply += Inflation/year + ~1,000,000 BBA

To assess the profitability of validators and the impact on network security, we can analyze the minimum requirement and the necessary BBA token value. Let's denote the minimum requirement as MR and the average BBA price as P. The number of validators is denoted as N.

The minimum requirement, MR, is estimated to be around $1,500. Therefore, we have:

MR = $1,500

To achieve profitability, the average BBA price, P, must reach a threshold of at least $1.5. Thus, we have:

$$P \geq \$1.5$$

If we consider a total of 1,000 validators (N = 1,000), the total value required would be:

$$\begin{aligned} \text{Total Value} &= N \times MR \\ &= 1{,}000 \times \$1{,}500 \\ &= \$1{,}500{,}000 \end{aligned}$$

This means that the total value required for 1,000 validators to operate profitably is $1.5 million.

This scenario is highly probable due to the expected significant increase in the value of BBA tokens resulting from the issuance of a minimal inflation rate. As the value of BBA tokens appreciates, validators will be motivated to compete for the best positions to validate transactions.

The increased competition among validators for optimal positions enhances network security and safety. Validators will have a vested interest in maintaining the network's integrity, as it directly affects the value of the BBA tokens they hold and the profitability of their operations.

Therefore, the expected rise in BBA token value incentivizes validators to actively participate, which leads to improved network security and stability.

Furthermore, validators actively purchase BBA tokens to strengthen their validity as validators contribute to the overall value of BBA tokens. This mutually beneficial relationship between validators and the BBA price enhances network security and stability.

By combining the initial rewards based on years spent on the blockchain and rewards from the fixed inflation rate, BBACHAIN effectively incentivizes validators, promotes active participation, and ensures the long-term sustainability and growth of the network.

2.4. BBA Economics and Allocation

In the first 100 years, the circulating supply of BBA is expected to reach a total of 296 million BBA; 1,000,000/year, so we have 100,000,000 BBA in the first 100 years. This includes 146 million core coins that will be released gradually over time. And the initial release at the Genesis block will consist of 50 million BBA.

To ensure long-term sustainability and value appreciation, BBACHAIN implements the Algorithm of Dichotomy (AOD). The AOD algorithm triggers a halving event every 365.25 days, reducing the BBA rewards by half from the Genesis block. This mechanism fosters scarcity, addresses inflation concerns, and promotes the growth of BBA by gradually decreasing the token supply, ultimately contributing to its value and stability.

The Figure 2 illustrates the BBA allocation for different aspects.

- 50% of the BBA tokens are allocated to the Cloud Validators Cluster, incentivizing validators, and ensuring network security.
- 16% of the BBA tokens are dedicated to supporting the ecosystem, fostering growth, and encouraging usage within the BBACHAIN ecosystem.
- 15% of the BBA tokens are allocated for marketing efforts to promote awareness, adoption, and the overall success of the BBA.
- 12% of the BBA tokens are reserved for developers, providing resources for ongoing development, innovation, and improvement of the BBACHAIN platform.
- 3% of the BBA tokens are set aside for strategic partners, forming alliances and collaborations that can enhance the value and utility of BBA.
- 2% of the BBA tokens are allocated to advisors who provide guidance and expertise in the strategic direction and development of BBACHAIN.
- 2% of the BBA tokens are dedicated to the seed round, providing initial funding and support for the project's launch and development.

This distribution ensures that various stakeholders are involved in the growth and success of BBA, including validators, ecosystem participants, marketing efforts, developers, strategic partners, advisors, and early investors.

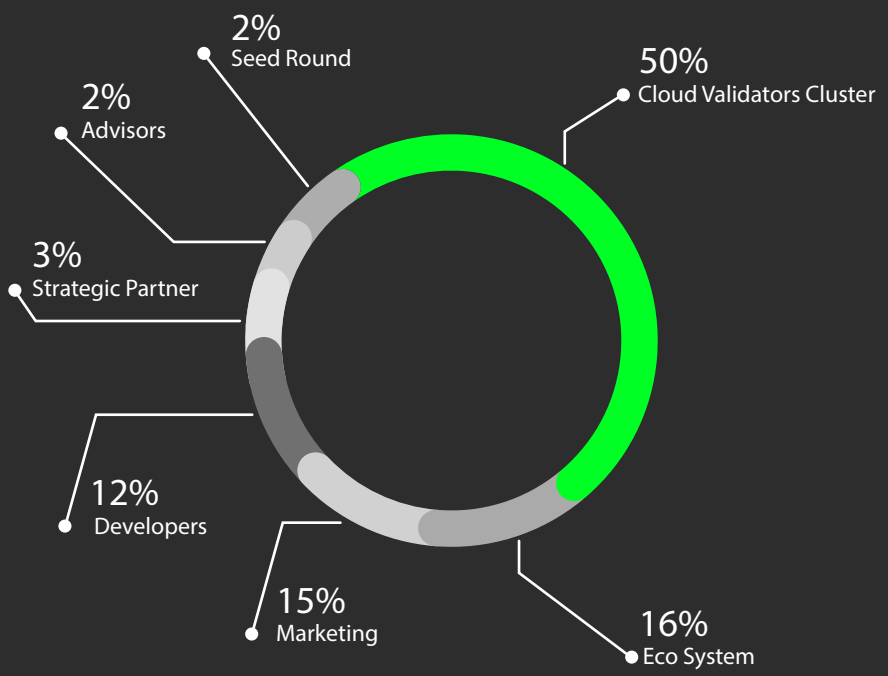

Figure 2 : BBA Allocation Chart

2.5. Network Design

Time to create a new block 0.4 seconds. 1 second initializes 2.5 blocks limit of 40,000 transactions per block, Equivalent to 100,000 tps.

BBACHAIN is a cutting-edge decentralized blockchain network designed to deliver fast and secure transactions. At its core, the network employs the efficient and secure Proof of Stake (PoS) consensus mechanism. This mechanism enables validators to actively participate in the creation and validation of blocks based on the number of tokens they hold and are willing to stake. By involving token holders in the consensus process, BBACHAIN ensures a robust and decentralized network operation.

To guarantee the integrity and immutability of its ledger, BBACHAIN leverages the power of the Merkle tree structure. This sophisticated data structure enables the network to summarize and verify vast amounts of data, such as transactions within a block, in a tamper-proof manner. By utilizing the Merkle tree, BBACHAIN fortifies the security and transparency of its blockchain, preventing any unauthorized modifications or fraudulent activities.

In its pursuit of unparalleled performance, BBACHAIN has implemented the Traces of Times algorithm, an innovative upgrade to the traditional Proof of History (PoH) algorithm. This advanced algorithm empowers BBACHAIN to achieve exceptional transaction speeds and effortlessly handle substantial transaction volumes. By incorporating the Traces of Times algorithm, BBACHAIN demonstrates its commitment to providing a highly scalable and efficient blockchain platform.

BBACHAIN is built on a unique blockchain network that combines several innovative algorithms and technologies to provide advanced functionality and performance. Let's explore each of these aspects in more detail:

Proof of Stake (POS) Algorithm:

BBACHAIN utilizes the Proof of Stake (POS) algorithm as its consensus mechanism. POS relies on validators who hold a certain amount of BBA tokens to secure the network and validate transactions. Validators are selected based on their stake, and their probability of being chosen to validate a block is proportional to the number of tokens they hold and are willing to "stake." POS offers energy efficiency and scalability advantages compared to traditional Proof of Work (POW) algorithms.

Proof of History (POH) Algorithm:

Incorporating the Proof of History (POH) algorithm, BBACHAIN ensures the chronological ordering of events on the blockchain. POH generates a verifiable record of historical events, enabling nodes to establish a linear timeline without relying solely on timestamps. This algorithm enhances the efficiency and reliability of the blockchain network by providing a secure and tamper-resistant history of transactions.

Derived of Half (DOH) Algorithm:

BBACHAIN leverages the Derived of Half (DOH) algorithm, which introduces a unique approach to achieving consensus. DOH combines elements of deterministic and probabilistic mechanisms, allowing validators to reach consensus through a balanced and efficient process. This algorithm optimizes block creation and validation, contributing to the overall performance and stability of the network.

Algorithm of Dichotomy (AOD) Algorithm:

The Algorithm of Dichotomy (AOD) is another key component of BBACHAIN's technical infrastructure. AOD is designed to enhance security and efficiency by enabling parallel processing and computation. It partitions complex tasks into smaller, more manageable segments, which are processed simultaneously, resulting in faster transaction verification and improved scalability.

Maximum Processing Speed of 100,000 TPS:

BBACHAIN achieves an impressive maximum processing speed of 100,000 transactions per second (TPS). This high throughput enables fast and efficient transaction processing, making BBACHAIN suitable for various use cases that require rapid confirmation and settlement of transactions. The network's scalability and performance contribute to its ability to handle a significant volume of transactions without compromising security or decentralization.

Extremely Low Transaction Fees:

The BBACHAIN platform offers extremely low transaction fees, set at 0.000001 BBA per transaction. This nominal fee equates to the ability to process one million transactions for just one BBA token. The low transaction fees contribute to the affordability and accessibility of the network, making it cost-effective for users to conduct frequent and small-scale transactions.

Auto-Adjustment of Transaction Fees:

BBACHAIN automatically adjusts transaction fees based on the number of transactions per second (TPS). Under ideal transaction conditions of 100,000 TPS, the transaction fee remains stable at 0.000001 BBA per transaction (equivalent to 1 million transactions per BBA fee). This fixed fee structure provides predictable and affordable transaction costs for users.

Dynamic Fee Adjustment for High Transaction Loads:

To handle transaction volumes that exceed the ideal condition of 100,000 TPS, BBACHAIN implements a dynamic fee adjustment mechanism. When the transaction rate surpasses this threshold, the system automatically adjusts the transaction fee to a maximum of 200,000% of the base fee. This adjustment acts as a safeguard against potential spam bot attacks, ensuring the stability and integrity of the BBACHAIN system.

Transaction Limit per Block:

BBACHAIN proactively limits the number of transactions per block to 40,000. This restriction ensures that each block can be processed efficiently within the network's capacity. Transactions exceeding this limit are rejected by the system, preventing congestion and maintaining optimal performance.

Anti – Spam:

Technological solutions are applied to avoid spam on the BBACHAIN System.

Below 100,000 TPS, transaction fees are stable at 0.000001 BBA per transaction. Above 100,000 TPS, the transaction fee will automatically adjust to 100% for each transaction, until it reaches 200,000%, up to a maximum of 0.002 BBA/transaction.

Subsequent transactions will be rejected, users need to re-do the transaction to be recorded in the next Block.
At one point, if the BBACHAIN system records the Total Transactions in excess of 100,000 TPS, it could be spam. The anti-spam system is immediately activated.

At this time, the Anti-spam mechanism and prevent spam transactions on BBACHAIN's network system is activated to prevent timely acts of intentionally intruding and sabotaging BBACHAIN's network, to ensure that the network always growing steadily.

With a special Anti-spam mechanism, BBACHAIN avoids exceeding the transaction limit at the same time, causing network congestion, even network failure. The purpose of wasting resources of Spammers. However, it is a great thing because this mechanism will increase the block reward for Node Validators.

Validators:

The Validators refers to the operational mechanism of a blockchain that relies on Validators to authenticate transaction data and uphold network security and decentralization. In the context of the Proof of Stake (PoS) consensus algorithm, the individuals or entities operating the validating nodes are referred to as Validators. A higher number of active nodes in a block- chain network enhances its security and decentralization.

By adopting the PoS algorithm, the blockchain network can benefit from a larger number of active nodes, leading to faster transaction authentication and a simplified setup of a Validator. This approach also offers significant cost reductions associated with mining, electricity consumption, and equipment maintenance.

Validators, also known as Node Validators, are authorized Network Nodes responsible for validating and verifying transactions, as well as generating new blocks within the blockchain network. Their primary role involves examining the validity of new transactions and blocks before incorporating them into the ledger. This process typically involves scrutinizing the signature, confirming the transaction's validity, and ensuring adherence to the rules and protocols of the blockchain network.

To become a Validator, an individual usually needs to stake a specific number of BBA on BBACHAIN's network. This requirement ensures integrity and compliance with the rules of the Validator system.

The Validator plays a vital role in maintaining the safety, integrity, and reliability of BBACHAIN's network, diligently performing its duties to uphold network security and decentralization.

The BBACHAIN is Layer I:

Layer I play a pivotal role in the blockchain ecosystem, serving as the bedrock upon which the entire network is built. It provides the essential infrastructure required for the development of robust and scalable ecosystems. Acting as the foundational layer, Layer I facilitate the execution and validation of transactions for smart contracts, ensuring the secure and efficient functioning of decentralized applications (dApps).

One of the key distinguishing features of Layer I blockchains is their self-sufficiency. Unlike some other blockchain networks that rely on interoperability with external chains, Layer I blockchains operate independently and are capable of functioning autonomously. This independence grants them greater control and flexibility over their own governance, consensus mechanisms, and economic models.

By operating on their own, Layer I blockchains can maintain a high degree of security and reliability. They do not rely on external networks for consensus verification, which mitigates the risk of potential vulnerabilities or attacks originating from interconnected chains. Additionally, this self-sufficiency allows Layer I blockchains to optimize their performance and tailor their protocols specifically to the needs of their ecosystem.

Furthermore, Layer I blockchains act as a foundation for the entire blockchain stack. They provide the underlying infrastructure that supports the operation of subsequent layers, such as Layer II solutions or specialized protocols. This hierarchical architecture enables the seamless integration of various layers, facilitating enhanced scalability, interoperability, and functionality within the overall blockchain network.

Layer I is a crucial component of the blockchain landscape. It establishes the fundamental infrastructure for ecosystem development, transaction execution, and smart contract validation. With its self-sufficiency, Layer I blockchains offer independence, security, and flexibility, while also serving as a solid foundation for the integration of other blockchain layers.

2.6. Traces of Times

BBACHAIN utilizes the Traces of Times consensus algorithm, specifically designed to enhance transaction speeds and accommodate larger transaction volumes, surpassing conventional blockchain networks. This algorithm represents an advancement over the Proof of History (PoH) algorithm and leverages the concept of time-stamping transactions to achieve its objectives.

By building upon the foundation of the PoH algorithm, Traces of Times introduces innovative features that expedite transaction processing. This is accomplished through the utilization of time as a fundamental element and the incorporation of cryptographic signatures to verify the authenticity and validity of transactions.

The Traces of Times algorithm capitalizes on the concept of time-stamping, which enables BBACHAIN to achieve faster transaction speeds. Transactions are efficiently processed and validated, leveraging the cryptographic signatures associated with the respective time-stamps. This ensures that transactions are secure and accurate, leading to improved overall network performance.

Moreover, Traces of Times enables BBACHAIN to accommodate larger transaction volumes, surpassing the limitations experienced by traditional blockchain networks. By optimizing the use of time and cryptographic mechanisms, BBACHAIN can handle a higher volume of transactions, enhancing scalability and usability for users.

2.7. Program Executor

BBACHAIN's Program Executors are executable codes stored in buffer storage, called an account, that can be executed via transaction, similar to smart contracts on Ethereum or any other programmable blockchain. However, unlike Ethereum, where the program and state are stored together in the smart contracts, Program Executors have adopted a stateless program model approach where data and execution are stored in accounts.

What are the types of Program Executors in BBACHAIN?

BBACHAIN's ecosystem constitutes two distinct types of programs: Native Program Executors and Runtime Program Executors.

What is a Native Program Executor?

Native Program Executors are responsible for implementing core functionalities of the network, such as managing the allocation of account storage, creating new accounts, processing transactions, and enforcing the rules of the network.

Native Program Executors are an integral part of BBACHAIN's core blockchain model. They are typically written in low-level languages like Rust and C/C++, optimized for performance and security. Updating these programs can only happen as a part of core blockchain upgrades or cluster upgrades to add features, fix bugs, or improve performance.

- System Program

  System programs are responsible for creating new accounts, transferring BBA between accounts, assigning account ownership, and performing more such account management operations.

- Stake Program

  A Stake Program is responsible for managing the staking of BBA on the blockchain network.

What is a Runtime Program Executor?

Runtime Program Executors are user-written programs (i.e., smart contracts) that are deployed directly on the blockchain. These can range from a dapp, an exchange, practice contracts, a multi-sig wallet implementation, or any other generic program.

Unlike Native Program Executors, Runtime Program Executors do not form the core of BBACHAIN. Instead, they are custom programs created and deployed by developers on the blockchain network. This means that Runtime Program Executors are not essential for the operation of the network.

They are built on top of the core infrastructure provided by the Native programs and allow developers to build a wide range of applications and services on the blockchain network.

The data that the programs interact with are stored in separate data accounts and passed in as references via instructions. Only the account owner can upgrade the program data.

2.8. Transactions

BBACHAIN is a decentralized platform that enables secure and efficient transactions using its native BBA tokens. BBA tokens serve as the medium of exchange within the network, allowing users to seamlessly transfer value and assets between different addresses on the BBACHAIN network.

The network's integrity and validity of transactions are ensured by its network validators, which play a critical role in verifying and validating transactions. They make sure that transactions adhere to the network's predefined rules and protocols, which establishes a consensus mechanism that upholds the security and reliability of the transactional ecosystem.

Every transaction that occurs on the BBACHAIN network is recorded on the blockchain ledger. This decentralized ledger is maintained by a network of nodes, ensuring transparency and immutability. The blockchain ledger serves as an auditable and tamper-proof record of all transactions, providing a comprehensive history of the network's activities.

BBACHAIN uses Dalton as the unit of account to determine the cost associated with processing transactions. This incentivizes validators and supports the infrastructure of the network. Dalton is also used as the fee denomination, establishing a fair and consistent pricing mechanism for conducting transactions on the network.

BBACHAIN has a maximum processing speed of 100,000 transactions per second (TPS), making it suitable for various use cases that require rapid confirmation and settlement of transactions. The network's scalability and performance enable it to handle a significant volume of transactions without compromising security or decentralization.

BBACHAIN offers extremely low transaction fees, set at 0.000001 BBA per transaction, making it cost-effective for users to conduct frequent and small-scale transactions. Under ideal transaction conditions of 100,000 TPS, the transaction fee remains stable at 0.000001 BBA per transaction (equivalent to 1 million transactions per BBA fee), providing predictable and affordable transaction costs for users.

To address transaction volumes that exceed the ideal condition of 100,000 TPS, BBACHAIN implements an intelligent fee adjustment mechanism. When the transaction rate surpasses this threshold, the system dynamically adjusts the transaction fee, capping it at a maximum of 200,000% of the base fee. This measure acts as a safeguard against potential spam bot attacks, ensuring the network remains secure and protected.

BBACHAIN takes a proactive approach maintaining optimal performance by limiting the number of transactions per block to 40,000. This deliberate restriction prevents congestion within the network, allowing for efficient processing and smooth operation. Transactions that exceed this limit are automatically rejected by the system, further enhancing the network's overall efficiency.

Within the BBACHAIN network, secure and efficient transactions are facilitated through the use of BBA tokens, the native currency of the platform. These tokens serve as the medium of exchange, enabling seamless transfers of value and assets between different addresses within the decentralized network. By utilizing BBA tokens, users can transact with confidence, leveraging the benefits of decentralized exchange.

The integrity and validity of each transaction on BBACHAIN are ensured through the active participation of network validators. These validators play a critical role in verifying and validating transactions, ensuring adherence to the network's predefined rules and protocols. Through their collective efforts, BBACHAIN establishes a consensus mechanism that upholds the security and reliability of the transactional ecosystem, promoting trust and confidence among users.

Every transaction occurring on the BBACHAIN network is meticulously recorded on the blockchain ledger, which is decentralized and maintained by a network of nodes. This transparent and immutable ledger serves as an auditable record of all transactions, providing a comprehensive and tamper-proof history of the network's activities. This transparency fosters trust and accountability within the BBACHAIN ecosystem.

To incentivize validators and support the infrastructure of the BBACHAIN network, transaction fees are denominated in Dalton. Dalton serves as the unit of account within the BBACHAIN ecosystem, determining the cost associated with processing transactions. By utilizing Dalton as the fee denomination, BBACHAIN establishes a fair and consistent pricing mechanism, promoting transparency and predictability in transactional activities within the network.

2.9. Private Send

BBACHAIN integrates the advanced Private Send feature, offering users the ability to engage in anonymous transactions with heightened privacy and security. Private Send combines multiple transactions into a single transaction, effectively obscuring the trail of funds. This powerful privacy-enhancing capability fortifies user anonymity, creating a robust and confidential environment within the network.

With Private Send, BBACHAIN users enjoy an additional layer of anonymity and security in their transactions. By merging multiple transactions, the original source of funds becomes highly obscured, rendering it exceedingly difficult for external parties to track or identify specific transactions. This exceptional level of privacy protection mitigates the risks associated with identity theft and fraud, fostering a secure and trustworthy transactional experience.

By incorporating Private Send, BBACHAIN exemplifies its dedication to delivering a secure and privacy-centric platform. Users can confidently engage in confidential transactions, safeguarding their personal information and shielding themselves from potential threats. This feature empowers individuals to retain control over their financial activities while minimizing the risk of unauthorized access to sensitive data.

This process obscures the origin and destination of funds, making it highly challenging to trace the individual transactions involved. The mathematical algorithms and cryptographic techniques employed ensure the integrity and confidentiality of the transactional data, guaranteeing a robust and secure privacy solution for BBACHAIN users. When utilizing the Private Send feature on BBACHAIN, special techniques are employed to enhance privacy during transactions.

Let's consider a scenario where a user intends to transfer 1,000 BBA tokens. In a regular transaction, the blockchain would record the sender and the receiver as part of the transaction information. However, with Private Send, the focus is on obfuscating the sender's identity while only revealing the receiver's information on the blockchain.

To achieve this, BBACHAIN incorporates a technique that removes user identity from the transaction information visible on the blockchain. This means that the transparent information stored on the blockchain will only reflect the receiver's details, similar to how other blockchains' transaction outputs solely show the recipient of newly generated coins.

By implementing this technique, BBACHAIN ensures that user identity remains concealed in the transaction record. This enhances the privacy of the sender, making it difficult for external observers to trace the transaction back.

Through the innovative design of the Private Send feature, BBACHAIN prioritizes user privacy and security. By removing the sender's identity from the transaction information, BBACHAIN provides users with a powerful tool to conduct confidential transactions, safeguarding their privacy and protecting them from potential risks associated with the exposure of sensitive information.

3. Benefits of Owning and Holding BBA

BBA offers numerous advantages that contribute to its increasing value over time:

- Sustainable asset growth potential: As a new blockchain platform, BBA facilitates continuous asset growth through the progressive development of its ecosystem. With increasing user adoption, the value of BBA assets has the opportunity to rise.
- Utility as transaction fee: Within the BBACHAIN system, BBA serves as the transaction fee. This means that all members of the Cryptocurrency community utilizing the BBACHAIN network must pay transaction fees using BBA.
- Rewards for Staking and Node Validators: BBA rewards individuals who stake their assets and act as Node Validators, ensuring the stability and smooth operation of the network.
- Development opportunities: BBA enables developers to create Program Library and build Layer II projects on the BBACHAIN platform, presenting exciting opportunities for innovation and expansion.
- Broad applicability: BBACHAIN's features focus on blockchain network development technology, offering versatility across various fields and industries.

Considering these factors, the value of BBA is anticipated to appreciate over time, benefiting BBA holders by enhancing their asset holdings.

4. BBACHAIN’s vision for the future

BBACHAIN prides itself on its ability to achieve faster transaction speeds, improve network scalability, reduce network costs, and establish a more stable network compared to previous blockchain generations. A key objective of BBACHAIN is to enhance the scalability of its system, enabling it to handle a large volume of transactions and meet the diverse needs of its users. This goal presents a significant challenge for Layer I blockchain systems, but BBACHAIN has a clear vision and a well-defined plan for the future.

According to this strategy, BBACHAIN aims to develop and integrate new technologies and protocols into its network to improve scalability and expedite transaction processing to optimal levels. Additionally, the plan includes expanding functionalities and enabling cross-platform usage. This entails supporting a wide range of applications, including payments, decentralized finance, smart contracts, data storage, and digital asset management. This comprehensive and inclusive approach highlights BBACHAIN's commitment to serving as a comprehensive solution for various blockchain requirements.

5. Disclaimer

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6. References

- Bahareh Lashkari and Musilek, P. (2021). A Comprehensive Review of Blockchain Consensus Mechanisms. [online] 9, pp.43620–43652. doi:https://doi.org/10.1109/access.2021.3065880.

- Gupta, S., Sinha, S. and Bhushan, B. (2020). Emergence of Blockchain Technology: Fundamentals, Working and its Various Implementations. [online] doi:https://doi.org/10.2139/ssrn.3569577.

- Bach, L.M., Mihaljevic, B. and Zagar, M. (2018). Comparative analysis of blockchain consensus algorithms. [online] doi:https://doi.org/10.23919/mipro.2018.8400278.

- Bhabendu Kumar Mohanta, Panda, S.S. and Jena, D. (2018). An Overview of Smart Contract and Use Cases in Blockchain Technology. [online] doi:https://doi.org/10.1109/icccnt.2018.8494045.

- Li, W., Feng, C., Zhang, L., Xu, H., Cao, B. and Imran, M. (2021). A Scalable Multi-Layer PBFT Consensus for Blockchain. [online] 32(5), pp.1146–1160. doi:https://doi.org/10.1109/tpds.2020.3042392.

- Sarada Prasad Gochhayat, Shetty, S., Ravi Mukkamala, Foytik, P., Kamhoua, G.A. and Laurent Njilla (2020). Measuring Decentrality in Blockchain Based Systems. [online] 8, pp.178372–178390. doi:https://doi.org/10.1109/access.2020.3026577.

- Bitcoin.org. (2022). Bitcoin: A Peer-to-Peer Electronic Cash System. [online] Available at: https://bitcoin.org/en/bitcoin-paper.

- Chainlink developers documentation (2021). Home [online] Available at: https://docs.chain.link/docs/adapters.

- Weidai.com. (1998). Available at: http://www.weidai.com/bmoney.tx

- Benet, J., Dalrymple, D. and Greco, N. (2017). Proof of Replication. [online] Available at: https://filecoin.io/proof-of-replication.pdf.

- Bitshares (2015). Home. [online] GitHub. Available at: https://github.com/bitshares/bitshares1-core/wiki/.

- Investopedia. (2022). What Are Consensus Mechanisms in Blockchain and Cryptocurrency? [online] Available at: https://www.investopedia.com/terms/c/consensus-mechanism-cryptocurrency.asp.