KiiChain

A modular layer 1 built for emerging market finance: tokenization of real-world assets, DeFi, payment settlement, and much more.

Abstract

A lot has transpired since Satoshi's whitepaper announcing the arrival of Bitcoin in 2008 as Bitcoin has become the digital gold standard and is positioning itself as the reserve currency of the world. In 2013,

Etherum established itself as the leader in layer 1 infrastructure, initiating the cycle of growth among web2 and web3 businesses. Since then, over 10,000 tokens have been publicly launched, each with their unique focus.

The growth of each project has a common theme within the technology: Communication. Blockchain infrastructure connects users in ways never before, eliminating a centralized counterparty needed to facilitate that connection, and instead proposes changes to the architecture enabling decentralization as the preferred means of communication. Even though this change has prompted user adoption globally, there remains gaps in the technology that adjust to specific market and cultural conditions in emerging economies.

In developing countries in Latin America, users can't adopt blockchain settlements where the gas fees are more expensive than the product or service itself, and many users and businesses fail to understand the benefits when building on blockchains abroad. The current transfer of value mechanisms that connect emerging economies to developed economies are overly centralized, slow and costly. It's determined to be why emerging economies in the last 25 years have yet to really "emerge". These transfer of value networks have failed to improve globalization and local commerce in an efficient way, connecting important economic counterparts in order to create uniformity in how they communicate.

Although economically a very large industry, emerging markets don't just thrive on remittances from users aboard. Their economies are normally derived from production locally. Whether its natural resources and commodities, exports of goods, imports for raw materials for production of those goods, the necessity for a B2B commodity and product based settlement network is clear given that the B2B market is 10x+ the size of consumer remittances with higher average volumes and transactions. Faster fiat settlements, safer FX solutions, and access to international credit terms are only a few of the current pain-points within the market.

KiiChain is unwaveringly committed to delivering high-performance, interconnected, and ultra-secure blockchain solutions as a driver in economic development in emerging markets in an effort to improve communication and globalization. At the heart of our technological prowess is the CometBFT mechanism, a solution for problems that exist in the economy, particularly emerging economies and Latin America. However, more than just a blockchain, Kii Global has built an ecosystem of solutions that include a centralized exchange streamlining institutional liquidity to an array of low cost fiat cash solutions and a robust DeFi mobile app offering an array of low cost custodial and swap solutions.

Introduction to KiiChain

KiiChain is a trailblazing tokenization and payment settlement ecosystem tailored for Latin America and emerging markets. It seamlessly melds with prevailing payment infrastructures, aiming to alleviate the exorbitant costs and reduce barriers in economic transactions.

This system rides on the back of the Cosmos' CometBFT - a testament to its decentralization and commitment to achieve lightning-fast transactions and minuscule network fees. Primarily, its design suits the daily exigencies of emerging economies, taking into account the wealth imbalances that exist. KiiChain's Comet mechanism boasts supercar-fast validators that produce blocks in seconds, allowing instantaneous transaction times and a fee on the network less than *one peso*.

The Kii blueprint saw expansion within its product and app suite, incorporating decentralized mobile wallets and a centralized exchange (KIIEX) specifically conceptualized for payment settlement assimilations as the core product which enables further expansion of web2 and web3 products. The product suite provides institutional infrastructure and liquidity connecting global players to local operators. KiiChain is customizable, and will support smart contracts written and deployed with Solidity. Its ecosystem supports a suite of tools that allows developers to build a wide variety of dApps.

Recognizing the exorbitant costs associated with both local and global payments and the palpable need for a speedier and cost-effective solution, Danyel Arenas and Alex Cavallero forged the KiiChain concept. Their collective vision? To sculpt a robust, secure, and scalable payment arena that ushers in the next generation of tokenized use cases for real world use, and expand the horizon of what's possible within web3.

Philosophy and Vision

While the cryptocurrency space is saturated with a myriad of options, Kii Global distinguishes itself through its profound commitment to societal betterment. Beyond the technical marvels and financial prospects, KiiChain's ethos is rooted in fostering an accessible, and inclusive financial landscape, especially for the Latino community.

Currently, 50% of citizens in developing countries are unbanked, or underbanked. The main reason: their income isn't sufficient enough to pay for the monthly costs associated with traditional financial services. As a result, these users, and many small businesses associated, lack access to basic financial services and credit lines.

As the world rapidly pivots to a decentralized financial paradigm, Kii Global envisions itself at the forefront - not merely as a passive participant but as an active change-maker. By continually iterating on its offerings, forging meaningful partnerships, and staying attuned to the real-world needs of its users, Kii Global is not just building a blockchain; it's crafting the future of finance by combining zero-fixed cost solutions with problem-solving web3 applications.

At the heart of it all, Kii Global is more than just a blockchain company. It's a beacon of hope, a promise of a brighter financial future, and a testament to what's possible when *innovation meets empathy*. Our main goal: *create a systemic shift in the middle class in emerging markets.*

The Problems We Solve

Undoubtedly current blockchain infrastructure solves many significant problems within a transfer of value settlement network. However, KiiChain is designed to solve current industry problems within its geographical focus.

Tokenization of RWA in a High Interest, Low Liquidity Market.
Emerging markets historically suffer from high inflation, high interest rates, and less access to institutional lending. Tokenization of RWA is focused on solving traditional and emerging use cases:

1. Accessibility via Fractional Ownership: Emerging markets often lack the infrastructure for widespread investment opportunities. Tokenization enables fractional ownership, allowing investors to buy small portions of high-value assets. This makes investing accessible to a broader range of individuals who may not have the capital to buy entire assets.
2. Liquidity: Traditional real estate and other asset investments in emerging markets can be illiquid, with long holding periods. Tokenization allows for easier trading of these assets on secondary markets, enhancing liquidity and increasing yield from said assets.
3. Asset Fractionalization: In emerging markets where large assets such as real estate or infrastructure projects are typically owned by the wealthy. Tokenization enables these assets to be divided into smaller, more manageable units that can democratize access and stimulate economic growth by broadening ownership to individuals who cannot afford to purchase an entire asset or property.
4. Lower Costs: Exportation of commodities suffer from saturated Intermediaries that leave the producers with low margins. Tokenization can streamline the purchase and/or investment process, reducing transaction and trade costs.
5. Global Access: tokenized assets can be traded globally, allowing investors from anywhere in the world to participate in emerging market opportunities. RWA dApps seek access to Latin America markets but don't have the resources to bridge to reputable parties in the region.
6. Transparency: tokenizing assets on the public ledger can help mitigate certain risks around unclaimed or disputed land.
7. Compliance and Regulation: Tokenization platforms can integrate compliance mechanisms directly into smart contracts, ensuring that transactions adhere to relevant regulations, and protect investor rights.
8. Stagnant: RWA tokens often lack cross-chain functionality and bridging. KiiChain will become the AppChain for IBC enabled RWA tokens.

The Best Cash Settlements in Latin America (LatAm)
Mainstream remittance and payment providers, tethered to archaic banking systems like ACH and SWIFT, grapple with inefficiencies, tardiness and inflated costs. Their modern counterparts, built on decentralized ledger tech, often falter at the "last mile", rendering their P2P solutions uneconomical.

Kii Global's ecosystem offers a much better on-ramp and off-ramp than any other provider in LatAm. Typical on and off-ramp services have limits, delays, and generally are not a reliable way to onboard into crypto or to off-ramp into fiat. KIIEX is able to utilize the local financial infrastructure, because they have built relationships with the local banks, which makes their services low cost, reliable, and without long delays. A spotlight feature of the exchange is its emphasis on "last mile delivery," addressing the importance of deep liquidity pairs against local fiat and the efficient verticalization of its on/off ramp rails for less than 1% cost. This infrastructure helps onboard more web2 users into web3.

Gas Fee Scalability for Micro-Payments
Scaling issues exist in current blockchain infrastructure because the amount of transactions processed in seconds is limited to total processing power. For example, Ethereum 2.0 can process roughly 30 transactions per second, therefore, it has to rely on sharding and rollups to scale horizontally and keep transactions flowing at minimal costs. High gas fees on Ethereum ($5 - $20 USD nominal) have prevented wide scale adoption among emerging markets. The majority of adoption thus far has been driven to more low cost gas networks like Tron. However, these networks are becoming more and more congested and the need for a more robust, structured decentralized solution is evident.

Cosmos' CometBFT can process roughly 10,000 transactions per second and is predesigned within the Inter-Blockchain Communication Pool (IBC). IBC works in conjunction with other layer 1s in the cosmos community to process transactions and keep gas fees minimal, *forever*.

Access to Institutional Liquidity & Credit
50% of individuals in emerging markets are underbanked and have extremely limited access to credit terms. The other 50% struggle with high banking costs and interest rates. Kii Global's layer 1 with infrastructure for DeFi lending options mixed with the liquidity settlements of its centralized exchange is solving these problems.

Through bridging the capital disparities between developed and emerging economies, the Kii ecosystem will support a wide range of DeFi lending protocols tailored for emerging markets in parallel with KIIEX's open liquidity to centralized applications.

User Friendly Tokenization
Cosmos based blockchains are built to deploy smart contracts written in Rust and deployed via CosmWasm. Although Rust is an advanced language of code with its benefits, there is a lack of real world developers who understand Rust, and companies who are looking to deploy their contracts with that language.

KiiChain has coded in the popular Solidity language for building and launching smart contracts, making KiiChain EVM compatible. Users can easily deploy their smart contracts, already written in Solidity, into the KiiChain. Kii Global has built an in-house dedicated team to help deploy user's smart contracts

within the blockchain. Companies looking for assistance on how to build smart contracts can rely on Kii Global's developers for support and assistance when writing and deploying code.

An Equitable Ecosystem Built for Latam

The Kii token and KiiChain gives a chance for Latam locals to participate in an ecosystem built just for them, and one they can own a piece of. Users can earn a return on their KII by staking it through validator nodes, and rewards are replenished with 5% of Kii Global's cash flow. This gives every Latam person an opportunity to take part of a community and a company with a vision of equitable justice for all.

A Compliant Ecosystem

KII is not at risk of clashing with the local government and banks, because the KII team has done the hard work of educating and building relationships with top banks and government officials in Latam. While most traditional financial institutions have a stigma as well as a lack of knowledge about crypto, KII is paving the way by building the infrastructure needed to offer frictionless cash settlement services. The KII team is a shining example of what right looks like, when it comes to compliance.

Ecosystem Product Line-Up

Kii Global is building an ecosystem to support the next generation of tokenization across emerging markets.

KiiChain

The KiiChain is an EVM compatible layer 1 designed for tokenization of real world assets and payment settlement. Time to finality is instant, meaning, transactions on the blockchain are processed faster than it takes for a mobile device to reload a web page. Network gas fees will be a fraction of a peso, and will not inflate more than a fraction of a penny.

KIIEX: Centralized Liquidity for Immediate Settlement and Open APIs.

Part of Kii Global's ecosystem is KIIEX, a centralized exchange platform bringing institutional liquidity and immediate settlement to places that need it the most. Apart from operating as a traditional trading platform, KIIEX is market-making the most popular fiat/crypto instruments in the region. By vertically integrating the cash-in and cash-out infrastructure, KIIEX is transforming the cost efficiency and timing of settlement in the region. Within its suite of products are open APIs where corporations and DeFi or payment apps can access these liquidity settlement options.

Kii Mobile

The Kii Wallet is transitioning into the KIIEX Defi wallet where users can manage their own keys and store their preferred assets. However, instead of only having the option to swap among DEX options with high transaction costs and low maximus, the DeFi app will have connectivity with KIIEX through API connections allowing instant swaps at costs significantly lower than traditional DEXs. In addition, the

app will also feature the most high profile RWA assets in the space and will allow tokenizers and liquidity providers to access each opportunity through decentralized means.

KiiView

KiiView will bring VIable Views AI data model on-chain through a decentralized application with multi-chain functionality within the Cosmos ecosystem. Viable View is a market intelligence platform that collects external market data and turns it into actionable insight. It's designed for entrepreneurs and sellers seeking impactful opportunities within the digital product, physical product, or SaaS market. By aggregating a vast spectrum of external data, refining it for quality, and applying advanced Go-To-Market (GTM) simulation models, users can translate complex market dynamics into clear, actionable takeaways that help more users build in the web3 ecosystem.

Use Cases

Tokenization of Commodities (RWA)

Commodities are among the most valuable and traded goods in the world with major reserves being mined and developed in emerging countries. Local companies can now tokenize their commodities and contracts, pricing them in Kii or a native asset to their project, and create instant liquidity on a global scale.

Tokenization of Products (RWA)

Imported and exported goods are one of the major drivers of GDP within Latin America and emerging economies. Many multinational companies in the region struggle to process funds and manage liquidity reserves. These products can be tokenized and transacted on the blockchain for users to transact with these goods, and for companies to better manage their reserves.

Tokenization of Real Estate (RWA)

Asset fractionalization and ownership is becoming more imperative than ever before in markets with wealth fragmentation, high inflation and high interest rates. Real estate and asset infrastructure fractionalization allows users to own yield bearing, inflation protected, assets that cannot be owned by these users in whole. By democratizing the ownership process, liquidity can extend to other markets and users who would not otherwise have access prior.

Tokenization of Debt and Equities (RWA)

Public equities, debt instruments, or exchange traded funds that are trading on traditional exchanges can be tokenized to expand, democratize and fractionalize their access cross-border, to individuals who do not have access to these opportunities.

DeFi Lending and Borrowing for Open Credit System

Credit is a huge issue in developing countries with strict underwriting standards, toxic level interest rates and lack of available capital. DeFi lending will provide secure ways for users in developed countries to extend safe credit terms to participants in emerging markets.

Yield Farming
High yield opportunities are plentiful in Latam, and can help generate this productive yield for yield farming aggregators to offer to lenders with liquidity.

Payment settlement and remittances
Upon block number 1, KiiChain can process 12,000 transactions per second (TPS) and can scale within the Cosmos ecosystem with IBC. Currently the Cosmos community is collectively synced to process ~500,000 TPS, and depending on the inclusion of future layer 1s, processing can increase to an *infinite number*. Transaction fees in KiiChain are a fraction of a peso and settlement is instantaneous. Users can seamlessly remit funds to any wallet in the world.

Spot and Forward Settlement
The B2B remittance market transacts over $600 billion USD. These importers and exporters either win or lose on spot or forward contract settlements. By each counterparty posting liquidity via a smart contract on the blockchain, users can eliminate losses by sharing in any FX swings.

Inflation Protection
KiiChain has a fixed supply 1,800,000,000 KII with no minting or burning of tokens. Therefore, the total amount can never be inflated. In fact, on the contract, 5% of cash flow from operations of Kii Global will be reverted back to purchasing Kii and replenishing the staking and rewards pool.

Business Model and Revenue Streams

Kii Global's activity will be driven through the suite of revenue generating products:

KIIEX Trading and Processing Fees
By inaugurating our proprietary centralized exchange platform, we're revolutionizing the remittance and payment experience for users. This nexus of cryptocurrency trading ensures seamless transactions, all while fostering an environment of growth and financial prosperity. KIIEX leads the market for cash-in/cash-out options in Latam.

DeFi Wallet Trading Fees
Our homegrown multi-currency decentralized wallet offers users a secure haven for their assets. Nominal trading and transfer fees not only ensure affordability for our users but also serve as a sustainable revenue stream for the KII ecosystem. This wallet, attuned to user needs, exemplifies the blend of security, functionality, and cost-efficiency, becoming an indispensable tool for every crypto enthusiast.

KiiView Fees

Users will pay for block time in native token to run the AI models. A percentage of those fees will be collected by Kii Global.

DeFi Commissions

5% of total supply is for posting liquidity to DEX operations, and after the public sale, that 5% will be matched in liquidity on the other side of the trade. These trades will produce revenue for the holding company.

Fees from Integrations

Our footprint in the blockchain space hasn't gone unnoticed. By integrating KII's robust ecosystem into conventional fintech enterprises, we've forged a revenue model wherein we glean a slice of every transaction made through our infrastructural offerings.

Secondary Suite of Products

Apart from the main revenue streams, Kii Global's roadmap entails launching a suite of banking-as-a-service products like cold storage processing cards which will further produce earnings for the company.

KiiChain Features

Introduction to KiiChain: *Leveraging the Superiority of CometBFT in Blockchain Architecture For Economic Development in Emerging Markets.*

Technical information provided by Cosmos.

Cosmos is a network of independent parallel blockchains that are each powered by classical BFT consensus algorithms like Tendermint 1. KiiChain is its own independent layer 1 Blockchain that will connect to the Cosmos Hub to take advantage of its benefits.

The Cosmos Hub is the inaugural blockchain in this network and serves as a pivotal connection point to various other blockchains (referred herein as *Zones*), including KiiChain, through the novel and innovative Inter-Blockchain Communication (IBC) protocol. It maintains a record of multiple token types and their quantities across all linked Zones. Thanks to this system, tokens can be transferred swiftly and securely between Zones without requiring a direct exchange, as all transfers between zones are channeled through the Cosmos Hub.

This design addresses several challenges currently facing the blockchain sector, including application interoperability, scalability, and easy upgradability. The Cosmos Hub is compatible with diverse blockchain systems like Bitcoind, Go-Ethereum, CryptoNote, and BNB, facilitating infinite scalability to

meet worldwide transaction demands. Additionally, its architecture is well-suited for cross-sector uses like decentralized exchanges.

Cosmos extends beyond a solitary distributed ledger, and the Cosmos Hub is not an isolated ecosystem or its focal point. Instead, it's part of a broader vision to create an open network of distributed ledgers, laying the groundwork for new financial systems built on cryptography, robust economic principles, consensus theory, transparency, and accountability.

Key Technical Highlights
Unmatched Transaction Speed
Forget the agonizing wait of sluggish transaction confirmations. CometBFT's Byzantine Fault Tolerant (BFT) consensus algorithm churns out rapid results. Speed is a priority, and CometBFT doesn't disappoint.

Time to finality: instant
Block speed: 5 seconds
Transactions per second: 12,000

Security
CometBFT properties ensure that unless more than one-third of the network is compromised, your data is impenetrable. It's a bedrock promise of reliability, and it aligns perfectly with KiiChain's commitment to robust security.

Seamless Chain-to-Chain Interactions
In today's digitized landscape, working in silos is a formula for stagnation. CometBFT's architecture thrives on interoperability, allowing for smooth interactions between disparate blockchains. KiiChain harnesses this feature to pave the way for limitless cross-chain operations.

Sustainability in Focus
As global awareness around climate change intensifies, CometBFT offers an eco-friendly alternative to energy-guzzling consensus mechanisms. This aligns seamlessly with Kii Global Blockchain's own sustainability goals. In a nutshell, CometBFT isn't just a mechanism; it's a blueprint for the future of blockchain technology. By integrating CometBFT into our architecture, KiiChain is not just keeping pace with advancements; we are setting the pace.

Technical Underpinnings of CometBFT: An Advanced Consensus Algorithm Distinguished in Efficacy
The efficacy of a blockchain architecture is, to a large extent, contingent on the robustness of its underlying consensus algorithm. CometBFT distinguishes itself as an exemplar in this arena, and it's instructive to delve into its operational intricacies to understand its superiority.

Sequential Consensus Rounds: A Tripartite Paradigm

CometBFT's consensus model operates through a tripartite sequence comprising Prevote, Precommit, and Commit phases. This algorithmic construct engenders an organized and deterministic approach to decision-making.

Prevote**:** In this phase, validators engage in a preliminary voting round to weigh the validity of a proposed block.

*Precommit***:** Conditional upon attaining a quorum of affirmative prevotes—specifically a two-thirds majority—the algorithm transitions to a more formalized commitment to the proposed block.

*Commit***:** A subsequent affirmation in this phase culminates in the irrevocable acceptance of the block into the blockchain.This sequential arrangement ensures procedural integrity and minimizes the potential for erroneous or malicious insertions.

Deterministic Finality: A Benchmark in Transaction Integrity
While various blockchain platforms employ probabilistic finality, CometBFT assures deterministic finality. Once a transaction attains consensus approval, it is irrevocably committed to the ledger, thereby eliminating any subsequent ambiguities or vulnerabilities.

Byzantine Fault Tolerance: Mitigating Systemic Risks
One of the most salient features of CometBFT is its capability to mitigate the Byzantine Generals Problem, a classical quandary in distributed computing. Comet's Byzantine Fault Tolerance ensures that the network sustains its functional integrity even when up to one-third of its nodes are compromised or malfunctioning.

Proof-of-Stake Economy: An Eco-conscious Approach
In juxtaposition to energy-intensive Proof-of-Work algorithms, CometBFT employs a Proof-of-Stake model. This renders the consensus process not only more efficient but also congruent with sustainable energy utilization protocols.

CometBFT Means Business
Launched in 2014, the Tendermint open-source project aimed to overcome the limitations of Bitcoin's proof-of-work consensus algorithm, particularly in terms of speed, scalability, and environmental impact. Leveraging and enhancing the Byzantine Fault Tolerance (BFT) algorithms originally developed at MIT in 1988, the Tendermint team pioneered the conceptual development of a proof-of-stake cryptocurrency. This innovation successfully tackled the "nothing-at-stake" issue, a problem prevalent in early proof-of-stake cryptocurrencies like NXT and BitShares1.0. CometBFT is the Tendermint upgrade.

Today, most Bitcoin mobile wallets rely on trusted servers for transaction verification due to the need for multiple confirmations in proof-of-work to ensure a transaction is irreversibly committed. This has led to successful double-spend attacks on platforms like CoinBase.

In contrast, CometBFT's blockchain consensus system enables secure and immediate verification for mobile-client payments. Designed to avoid forking entirely, CometBFT allows mobile wallets to confirm transactions instantly, facilitating trustless and practical payments on smartphones, which is also beneficial for Internet of Things applications.

Kii's validators function similarly to Bitcoin miners but use cryptographic signatures for voting. These validators, operating on dedicated, secure machines, are responsible for block commitment. Non-validators can delegate their Kii tokens to validators, earning a share of block fees and Kii rewards. However, there's a risk of penalty (slashing) if their chosen validator is compromised or breaches protocol rules. The proven reliability of CometBFT's consensus and the collateral deposits from both validators and delegators provide a measurable and dependable level of security for all network nodes and light clients.

Governance

Every distributed public ledger should include a constitution and a governance mechanism. Bitcoin, for instance, depends on the Bitcoin Foundation and its mining community to manage updates, a process that tends to be sluggish. Ethereum experienced a split into ETH and ETC following a hard fork to rectify TheDAO hack, primarily due to the absence of an established social contract or decision-making process.

On KiiChain, both validators and delegators have the power to vote on proposals. These proposals can automatically modify system settings (like the block gas limit), facilitate upgrades, or amend the blockchain's human-readable constitution, which dictates its policies. This constitution provides a framework for stakeholders to quickly and effectively address issues like theft or bugs, similar to TheDAO incident.

KiiChain network, with its commitment to interoperability among different policy zones, offers users unparalleled freedom and opportunities for unrestricted experimentation. Open governance is planned to be introduced on KiiChain within 12 to 24 months post-launch.

Validators

In classical Byzantine fault-tolerant (BFT) algorithms, each node has the same weight. In CometBFT, nodes have a non-negative amount of voting power, and nodes that have positive voting power are called validators. Validators participate in the consensus protocol by broadcasting cryptographic signatures, or votes, to agree upon the next block.

Validators' voting powers are determined at genesis, or are changed deterministically by the blockchain, depending on the application. For example, in a proof-of-stake application such as KiiChain, the voting power may be determined by the amount of staking tokens bonded as collateral.

NOTE: Fractions like ⅔ and ⅓ refer to fractions of the total voting power, never the total number of validators, unless all the validators have equal weight. >⅔ means "more than ⅔", ≥⅓ means "at least ⅓".
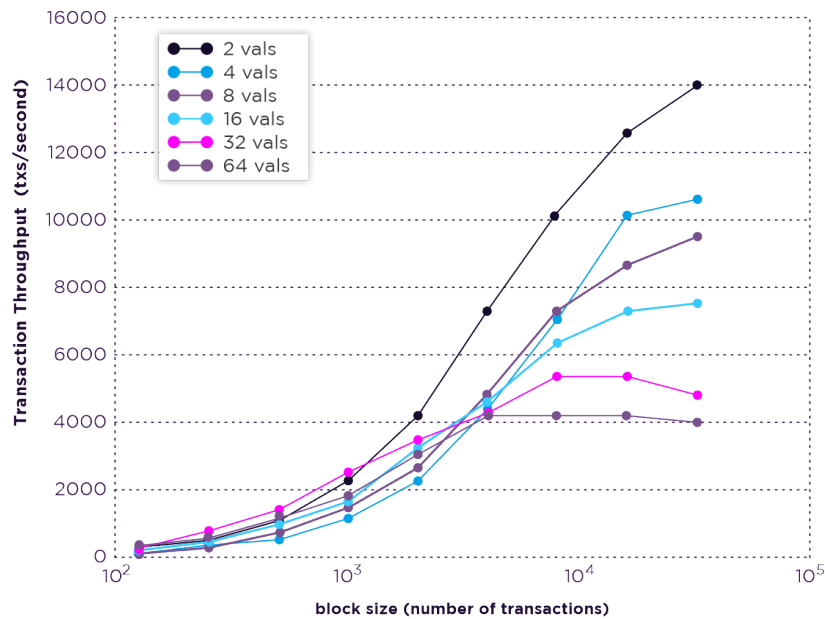
Consensus

CometBFT is a partially synchronous BFT consensus protocol derived from the DLS consensus algorithm [20]. CometBFT is notable for its simplicity, performance, and fork-accountability. The protocol requires a fixed known set of validators, where each validator is identified by their public key. Validators attempt to come to consensus on one block at a time, where a block is a list of transactions. Voting for consensus on a block proceeds in rounds. Each round has a round-leader, or proposer, who proposes a block. The validators then vote, in stages, on whether to accept the proposed block or move on to the next round. The proposer for a round is chosen deterministically from the ordered list of validators, in proportion to their voting power.

CometBFT's security derives from its use of optimal Byzantine fault-tolerance via super-majority (>⅔) voting and a locking mechanism. Together, they ensure that:

- ≥⅓ voting power must be Byzantine to cause a violation of safety, where more than two values are committed.
- If any set of validators ever succeeds in violating safety, or even attempts to do so, they can be identified by the protocol. This includes both voting for conflicting blocks and broadcasting unjustified votes.

Despite its strong guarantees, CometBFT provides exceptional performance. In benchmarks of 64 nodes distributed across 7 datacenters on 5 continents, on commodity cloud instances, CometBFT consensus can process thousands of transactions per second, with commit latencies on the order of one to two seconds. Notably, performance of well over a thousand transactions per second is maintained even in harsh adversarial conditions, with validators crashing or broadcasting maliciously crafted votes. See the figure below for details.

Light Clients

A major benefit of CometBFT's consensus algorithm is simplified light client security, making it an ideal candidate for mobile and internet-of-things use cases. While a Bitcoin light client must sync chains of block headers and find the one with the most proof of work, CometBFT light clients need only to keep up with changes to the validator set, and then verify the >⅔ PreCommits in the latest block to determine the latest state.

Succinct light client proofs also enable inter-blockchain communication.

Preventing Attacks

CometBFT has protective measures for preventing certain notable attacks, like long-range-nothing-at-stake double spends and censorship.

ABCI

The CometBFT consensus algorithm is implemented in a program called CometBFT's Core. CometBFT is an application-agnostic "consensus engine" that can turn any deterministic blackbox application into a distributed replicated blockchain. CometBFT BFT connects to blockchain applications via the Application Blockchain Interface (ABCI). ABCI is an interface that defines the boundary between the replication engine (the blockchain), and the state machine (the application). By using a socket protocol, we enable a consensus engine running in one process to manage an application state running in another. Thus, the ABCI allows for blockchain applications to be programmed in any language, not just the programming language that the consensus engine is written in. Additionally, the ABCI makes it possible to easily swap out the consensus layer of any existing blockchain stack.

We draw an analogy with the well-known cryptocurrency Bitcoin. Bitcoin is a cryptocurrency blockchain where each node maintains a fully audited Unspent Transaction Output (UTXO) database. If one wanted to create a Bitcoin-like system on top of ABCI, Tendermint would be responsible for

- Sharing blocks and transactions between nodes
- Establishing a canonical/immutable order of transactions (the blockchain)

Meanwhile, the ABCI application would be responsible for

- Maintaining the UTXO database
- Validating cryptographic signatures of transactions
- Preventing transactions from spending non-existent funds
- Allowing clients to query the UTXO database

CometBFT is able to decompose the blockchain design by offering a very simple API between the application process and consensus process.

ABCI consists of 3 primary message types that get delivered from the core to the application. The application replies with corresponding response messages.

The *AppendTx* message is the workhorse of the application. Each transaction in the blockchain is delivered with this message. The application needs to validate each transaction received with the AppendTx message against the current state, application protocol, and the cryptographic credentials of the transaction. A validated transaction then needs to update the application state — by binding a value into a key values store, or by updating the UTXO database.

The *CheckTx* message is similar to AppendTx, but it's only for validating transactions. CometBFT's mempool first checks the validity of a transaction with CheckTx, and only relays valid transactions to its peers. Applications may check an incrementing nonce in the transaction and return an error upon CheckTx if the nonce is old.

The *Commit* message is used to compute a cryptographic commitment to the current application state, to be placed into the next block header. This has some handy properties. Inconsistencies in updating that state will now appear as blockchain forks which catches a whole class of programming errors. This also simplifies the development of secure lightweight clients, as Merkle-hash proofs can be verified by checking against the block-hash, and the block-hash is signed by a quorum of validators (by voting power).

Additional ABCI messages allow the application to keep track of and change the validator set, and for the application to receive the block information, such as the height and the commit votes.

ABCI requests/responses are simple Protobuf messages. Check out the schema file.

AppendTx

- Arguments:
  - Data ([]byte): The request transaction bytes
- Returns:
  - Code (uint32): Response code
  - Data ([]byte): Result bytes, if any
  - Log (string): Debug or error message
- Usage:
  Append and run a transaction. If the transaction is valid, returns CodeType.OK

CheckTx

- Arguments:
  - Data ([]byte): The request transaction bytes
- Returns:
  - Code (uint32): Response code
  - Data ([]byte): Result bytes, if any
  - Log (string): Debug or error message
- Usage:
  Validate a transaction. This message should not mutate the state. Transactions are first run through CheckTx before broadcast to peers in the mempool layer. You can make CheckTx semi-stateful and clear the state upon Commit or BeginBlock, to allow for dependent sequences of transactions in the same block.

Commit

- Returns:
  - Data ([]byte): The Merkle root hash
  - Log (string): Debug or error message
- Usage:
  Return a Merkle root hash of the application state.

Query

- Arguments:
  - Data ([]byte): The query request bytes
- Returns:
  - Code (uint32): Response code
  - Data ([]byte): The query response bytes
  - Log (string): Debug or error message

Flush

- Usage:
  Flush the response queue. Applications that implement types.Application need not implement this message – it's handled by the project.

Info

- Returns:
  - Data ([]byte): The info bytes
- Usage:
  Return information about the application state. Application specific.

SetOption

- Arguments:
  - Key (string): Key to set
  - Value (string): Value to set for key
- Returns:
  - Log (string): Debug or error message
- Usage:
  Set application options. E.g. Key="mode", Value="mempool" for a mempool connection, or Key="mode", Value="consensus" for a consensus connection. Other options are application specific.

InitChain

- Arguments:
  - Validators ([]Validator): Initial genesis-validators
- Usage:
  Called once upon genesis

BeginBlock

- Arguments:
  - Height (uint64): The block height that is starting
- Usage:
  Signals the beginning of a new block. Called prior to any AppendTxs.

EndBlock

- Arguments:
  - Height (uint64): The block height that ended
- Returns:
  - Validators ([]Validator): Changed validators with new voting powers (0 to remove)
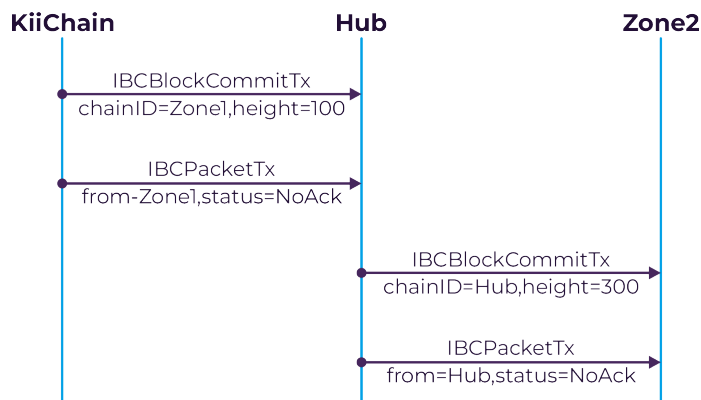
- Usage:
  Signals the end of a block. Called prior to each Commit after all transactions

IBC: Inter-Blockchain Communication

Now we look at how the Hub and zones communicate with each other. For example, if there are three blockchains, "Zone1", "Zone2", and "Hub", and we wish for "Zone1" to produce a packet destined for "Zone2" going through "Hub". To move a packet from one blockchain to another, a proof is posted on the receiving chain. The proof states that the sending chain published a packet for the alleged destination. For the receiving chain to check this proof, it must be able to keep up with the sender's block headers. This mechanism is similar to that used by sidechains, which requires two interacting chains to be aware of one another via a bidirectional stream of proof-of-existence datagrams (transactions). This is how KiiChain connects to the Cosmos Hub.

The IBC protocol can naturally be defined using two types of transactions: an IBCBlockCommitTx transaction, which allows a blockchain to prove to any observer of its most recent block-hash, and an IBCPacketTx transaction, which allows a blockchain to prove to any observer that the given packet was indeed published by the sender's application, via a Merkle-proof to the recent block-hash.

By splitting the IBC mechanics into two separate transactions, we allow the native fee market-mechanism of the receiving chain to determine which packets get committed (i.e. acknowledged), while allowing for complete freedom on the sending chain as to how many outbound packets are allowed.

KiiChain   **Hub**   **Zone2**

IBCBlockCommitTx
chainID=Zone1,height=100

IBCPacketTx
from-Zone1,status=NoAck

IBCBlockCommitTx
chainID=Hub,height=300

IBCPacketTx
from=Hub,status=NoAck

In the example above, in order to update the block-hash of "Zone1" on "Hub" (or of "Hub" on "Zone2"), an IBCBlockCommitTx transaction must be posted on "Hub" with the block-hash of "Zone1" (or on "Zone2" with the block-hash of "Hub").

Benefits

The IBC protocol is designed to facilitate secure and reliable communication between different blockchain networks. It is a critical component for interoperability in the blockchain space. The IBC

allows the transfer of data (tokens or other information, shared in packets) between independent blockchains. It establishes a standardized way for blockchains to read and write data to each other when transacting assets on another specific blockchain. The main benefits of IBC are:

1. Interoperability: Allows different blockchains to interact and share information, breaking down silos in the blockchain ecosystem.
2. Scalability: Enhances the scalability of networks by distributing workloads across multiple chains.
3. Enhanced Functionality: Different chains can specialize in various functions (e.g., privacy, speed, storage), and IBC enables them to leverage each other's strengths.
4. Decentralization: Promotes a more decentralized blockchain ecosystem by enabling a network of various blockchains rather than relying on a single chain.
5. Token Transfer: Facilitates the transfer of tokens and assets across different blockchain networks, expanding the utility and reach of digital assets.
6. Increased Innovation: The ability to connect different blockchains can lead to new types of applications and use cases that were not possible within a single blockchain system.
7. Security: Maintains high security standards, as blockchains can communicate while preserving their own internal consensus mechanisms and security protocols.
8. Community and Ecosystem Growth: Contributes to the growth of the Cosmos ecosystem by allowing new and existing blockchains to connect and interact.

Transaction Types – How Kii Interacts with the Cosmos Hub

In the standard implementation, transactions are transmitted to the Cosmos hub application through the ABCI (Application Blockchain Interface).

The Cosmos Hub will accept a number of primary transaction types from KiiChain, including SendTx, BondTx, UnbondTx, ReportHackTx, SlashTx, ProposalCreateTx, and ProposalVoteTx, which are fairly self-explanatory and will be documented in a future revision of this paper. Here we document the two primary transaction types for IBC: IBCBlockCommitTx and IBCPacketTx.

IBCBlockCommitTx

An IBCBlockCommitTx transaction is composed of:

- ChainID (string): The ID of the blockchain
- BlockHash ([]byte): The block-hash bytes, the Merkle root which includes the app-hash
- BlockPartsHeader (PartSetHeader): The block part-set header bytes, only needed to verify vote signatures
- BlockHeight (int): The height of the commit
- BlockRound (int): The round of the commit
- Commit ([]Vote): The >$\frac{2}{3}$ Tendermint Precommit votes that comprise a block commit

- ValidatorsHash ([]byte): A Merkle-tree root hash of the new validator set
- ValidatorsHashProof (SimpleProof): A SimpleTree Merkle-proof for proving the ValidatorsHash against the BlockHash
- AppHash ([]byte): A IAVLTree Merkle-tree root hash of the application state
- AppHashProof (SimpleProof): A SimpleTree Merkle-proof for proving the AppHash against the BlockHash

IBCPacketTx

An IBCPacket is composed of:

- Header (IBCPacketHeader): The packet header
- Payload ([]byte): The bytes of the packet payload. *Optional*
- PayloadHash ([]byte): The hash for the bytes of the packet. *Optional*

Either one of Payload or PayloadHash must be present. The hash of an IBCPacket is a simple Merkle root of the two items, Header and Payload. An IBCPacket without the full payload is called an *abbreviated packet*.

An IBCPacketHeader is composed of:

- SrcChainID (string): The source blockchain ID
- DstChainID (string): The destination blockchain ID
- Number (int): A unique number for all packets
- Status (enum): Can be one of AckPending, AckSent, AckReceived, NoAck, or Timeout
- Type (string): The types are application-dependent. Cosmos reserves the "coin" packet type
- MaxHeight (int): If status is not NoAckWanted or AckReceived by this height, status becomes Timeout. *Optional*

An IBCPacketTx transaction is composed of:

- FromChainID (string): The ID of the blockchain which is providing this packet; not necessarily the source
- FromBlockHeight (int): The blockchain height in which the following packet is included (Merkle-ized) in the block-hash of the source chain
- Packet (IBCPacket): A packet of data, whose status may be one of AckPending, AckSent, AckReceived, NoAck, or Timeout
- PacketProof (IAVLProof): A IAVLTree Merkle-proof for proving the packet's hash against the AppHash of the source chain at given height

The sequence for sending a packet from "Zone1" to "Zone2" through the "Hub" is depicted in {Figure X}. First, an IBCPacketTx proves to "Hub" that the packet is included in the app-state of "Zone1". Then, another IBCPacketTx proves to "Zone2" that the packet is included in the app-state of "Hub". During this procedure, the IBCPacket fields are identical: the SrcChainID is always "Zone1", and the DstChainID is always "Zone2".

The PacketProof must have the correct Merkle-proof path, as follows:

IBC/<SrcChainID>/<DstChainID>/<Number>

When "Zone1" wants to send a packet to "Zone2" through "Hub", the IBCPacket data are identical whether the packet is Merkle-ized on "Zone1", the "Hub", or "Zone2". The only mutable field is Status for tracking delivery.

The Hub and Zones - How KiiChain Connects to the Cosmos Hub

The Hub and Zones, powered by IBC, is an innovative model for growth and scalability in the decentralized blockchain ledger world. As we've discussed before, Cosmos is a network of multiple blockchains powered by CometBFT, and KiiChain is one of those blockchains. While existing proposals aim to create a "stand alone blockchain" with transaction processing dependent on their own network, or layer 2s that build under them, Cosmos permits many layer 1 blockchains to run concurrently with one another while retaining interoperability.

At its core the Cosmos Hub manages many independent blockchains called "Zones" (sometimes referred to as "shards" , in reference to the database scaling technique known as "sharding"). A constant stream of recent block information (commits) from Zones are posted on the Cosmos Hub, which allows the Cosmos Hub to keep up with the state of each Zone. Likewise, each Zone keeps up with the state of the Hub (however, Zones do not keep up with each other except indirectly through the Hub). "Packets" of information are then communicated from one zone to another by posting Merkle-proofs as evidence that the information was sent and received. This mechanism is called inter-blockchain communication, or IBC for short.

Any of the zones can themselves be hubs to form an acyclic graph, but for the sake of clarity we will only describe the simple configuration where there is only one hub, and many non-hub zones.
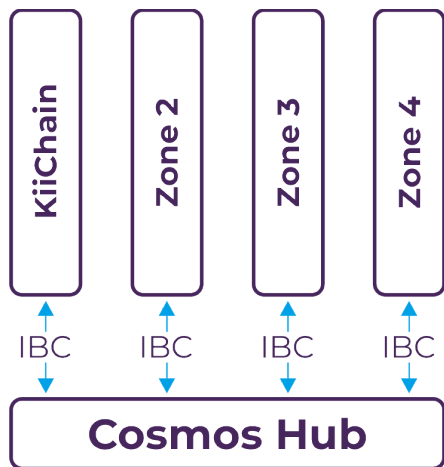
The Hub

The Cosmos Hub is a blockchain that hosts a multi-asset distributed ledger, where tokens can be held by individual users or by zones themselves. These tokens can be moved from one zone to another in a special IBC packet called a "coin packet" – this is how the information is communicated between the zone and the hub. The hub is responsible for preserving the global invariance of the total amount of each token across the zones. IBC coin packet transactions must be committed by the sender, hub, and receiver blockchains.

Since the Cosmos Hub acts as the central ledger for the whole system, the security of the Hub is of paramount importance. While each zone may be a CometBFT blockchain that is secured by as few as 4 validators (or even less if BFT consensus is not needed), the Hub must be secured by a globally decentralized set of validators that can withstand the most severe attack scenarios, such as a continental network partition or a nation-state sponsored attack.

The Zones

A Cosmos zone is an independent blockchain that exchanges IBC messages with the Hub and in this particular case, the zone is KiiChain. From the Hub's perspective, KiiChain is a *multi-asset dynamic-membership multi-signature account* that can send and receive tokens using IBC packets. Like a cryptocurrency account, KiiChain cannot transfer more tokens than it has, but can receive tokens from others who have them.

KII may be staked by validators on KiiChain while connected to the Hub. While double-spend attacks on these zones would result in the slashing of Kii with CometBFT's fork-accountability, a zone where >⅔ of the voting power are Byzantine can commit invalid state. The Cosmos Hub does not verify or execute transactions committed on KiiChain, so it is the responsibility of users to send tokens to zones that they trust.

Enabling Smart Contracts

The Polaris EVM module allows Ethereum-compatible smart contracts to run on a Cosmos blockchain, emulating the EVM environment. This module ensures compatibility with existing Ethereum tools and dApps, allowing developers to deploy Ethereum smart contracts written in Solidity on KiiChain.

The module processes and executes smart contracts written in Solidity similarly to how they would run on Ethereum's blockchain. Transactions intended for the EVM module are identified and processed. These can include contract deployment, contract interaction, or other EVM-specific operations. A benefit of the Cosmos EVM module is that it is integrated within the Cosmos SDK, therefore the module can coexist with other modules, providing flexibility and functionality to the blockchain.

By supporting Ethereum smart contracts, KiiChain can tap into the vast ecosystem of Ethereum developers and existing dApps, fostering greater collaboration among developers in emerging markets. The EVM module operates within its own execution environment, ensuring that issues within the EVM do not affect other parts of the blockchain, and opens the door for these contracts to interact with other IBC-enabled blockchains within the Cosmos network. This level of interoperability is a significant advancement in the blockchain space. The module manages Ethereum state separately from the Cosmos state. This segregation ensures that the EVM's state transitions and account models do not conflict with the Cosmos chain's state.

When integrating the EVM module, developers can configure it to suit their specific needs. This includes setting gas prices, enabling specific EVM functionalities, or defining how Ethereum transactions and smart contracts are handled within KiiChain. The module exposes APIs and RPC endpoints that are compatible with Ethereum's, allowing tools and applications built for Ethereum (like wallets and dApps) to interact with KiiChain chain without significant modifications. Developers can use standard development tools like Node.js applications and environments like Truffle or Hardhat are popular for Solidity development.

The KII token

While KiiChain operates within the Cosmos Hub, it runs its native asset, KII as a non-inflationary cryptocurrency. The token economics are vital for how the ecosystem will interact with the blockchain and will detail the use of the native token, KII. In this case, the token's value is designed to derive from its utility and use, rather than a speculative investment. The goal is to create a sustainable model that creates a profound community, compensates the validators and delgators for their work in the long run, and designs a structure that extracts maximum utility for KII. The point of this section is to explain that value within the ecosystem, the distribution of the tokenomics, the release and circulation expectations, and its general utility.

Tokenomics

KiiChain maximum cap is set at 1,800,000,000 Kii. At the genesis block, all 1,800,000,000 tokens are released into specified accounts, each with their purpose in the ecosystem. Kii has a fixed supply meaning extra tokens cannot be minted or created.

The initial distribution of Kii tokens and validators on Genesis will be distributed into the following categories:

3.00% Presale
10.00% Public Sale and CEX Liquidity
20.00% Team
67.00% Community

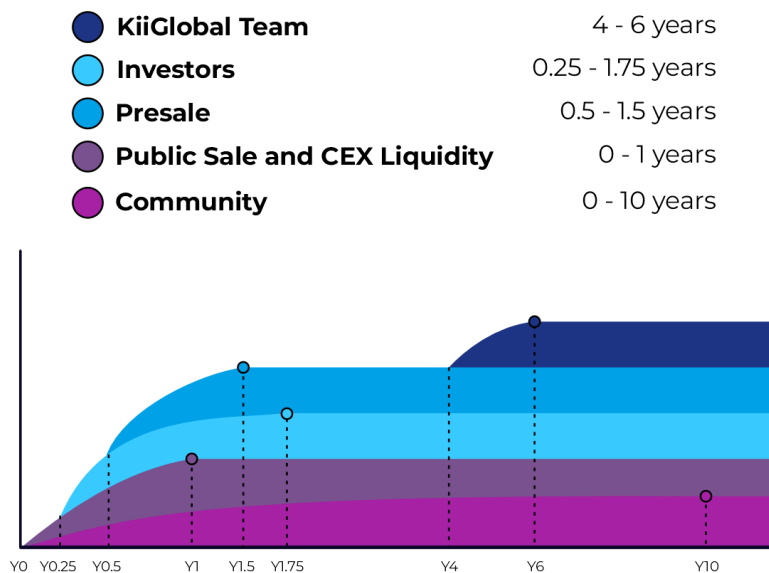| Category	% total Supply	Subcategoy	Amount of tokens
Presale	3%	Presale 1 (2021) (0.33%)	54.000.000
		Presale 2 (early 2022) (1%)	
		Presale 3 (late 2022) (1.67%)	
Public Sale and CEX Liquidity	10%	Public Sale (5.5%)	180.000.000
		CEX Liqudity, MM (4.4%)	
Team	20%	Kiiglobal Team (12.98%)	360.000.000
		Dev Team Contractors (0.66%)	
		Investors in SAFE Round (6%)	
		Advisors (0.33%)	
Community	67%	Staking and Rewards (48%)	1.206.000.000
		Airdrops & Competitions (2%)	
		Kii Foundation (10%)	
		DeFi Liquidity (7%)	

Token Vesting and Distribution

Token distribution and vesting was developed collectively between the founders and developers and is a result of many years of collective experience as users, investors, stakers and developers in other projects and blockchains. The collective result is a product from taking multiple points of views and considerations in account to protect the blockchain and community as a whole. It is strategically designed to prevent sudden fluctuations in price or volume and to prevent any one group or person from having an unfair advantage over the rest. Structurally, there needs to be a steady flow of supply relative to demand over a prolonged period of time, rather than short bursts in the release schedule.

There was a particular emphasis on the long cliff and vesting for team members behind the project, to show commitment to the longevity of the ecosystem and its community. Additionally, notable differences are the low amount sold in presale (3%), a differentiating factor among other projects who sell upwards of 30% to early investors who then unwind those positions aggressively in the market upon release with the users bearing the sell side pressure. Additionally, all vest/release schedules are emitted daily. The advantage of daily emission is users will sell or transfer on different days rather than all movements concentrated within one day or week. By seeding the company with internal investment, the economics were designed with the community users interests as the top priority. Once the final tokenomic distribution is finalized, it will be detailed below.
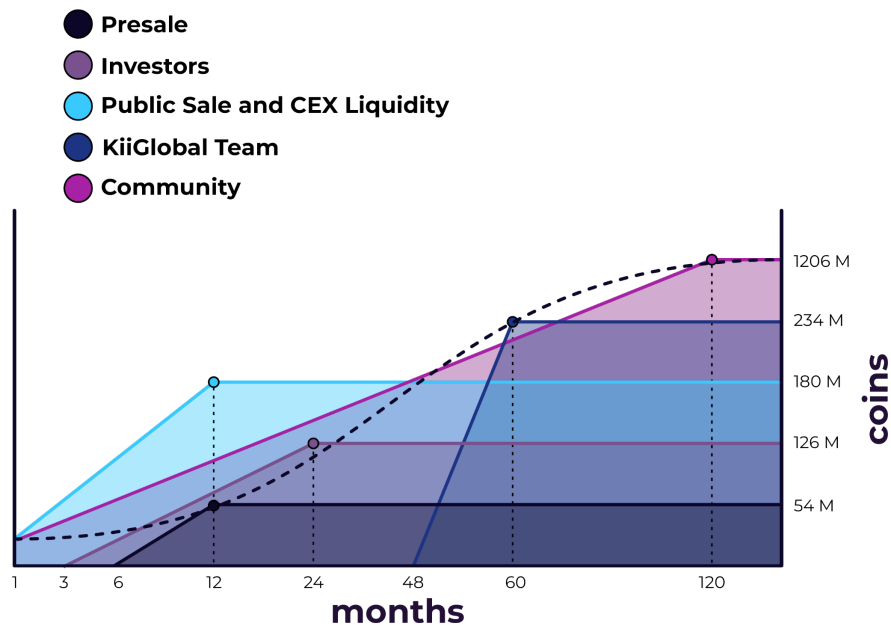
Token Circulation

The token circulation is an anticipated guide of how the tokens will be released and distributed. In any event, is it highly *unlikely* that all tokens will be available to trade in the market during these exact times and should be used more as a reference for token release rather than market availability.

Token release by category

Token dispersion trending line.

Legend:
- ● Presale
- ● Investors
- ● Public Sale and CEX Liquidity
- ● KiiGlobal Team
- ● Community

y-axis: coins — 1206 M, 234 M, 180 M, 126 M, 54 M
x-axis: months — 1, 3, 6, 12, 24, 48, 60, 120

The KII Token Utility

While KiiChain is its own independent blockchain connected to the Cosmo's Hub, the blockchain will run its native token, KII. Kii is the only staking token of KiiChain. Kii is a license for the holder to vote, validate, or delegate to other validators. Like Ethereum's ether, Kii can also be used to pay for transaction fees to mitigate spam. KII is a utility token with the following use cases:

- Network Health and Activity: KII acts as a community tool and is the only asset used among Validators, Delegratos, Operators, and Contributors. No other digital asset can be used to service the network.
- Payments: KII can be used for payment, remittances and any type of value settlement. Its utility is derived from being able to transfer value wallet to wallet.
- Tokenization pricing: users who deploy smart contracts on the blockchain can price their commodities or assets in KII and use the token for valuation means.
- Commission rewards: KII will act as the digital token for rewards to users validating and delegating on the blockchain. Additionally, within several models for its DeFi protocols, KII will act as the commission token for trading and spot and forward contract hedging.
- Governance: KII enables decentralized governance, where token holders can vote on proposals and changes to the network.
- Security: By decentralized use of validating and staking, users can protect malicious attacks to the network.

- Autonomy as a Community: The Kii Global ecosystem is independent and fully functional. It does not depend on other large parties for its operation. Therefore, KII empowers users at the heart of decentralized finance.
- Non-inflationary Design: KII is a non-inflationary digital asset used within its models, therefore users will not suffer from common inflationary related problems.

Evergreen Rewards Pool

Unlike most blockchain ecosystems, 5% of Kii Global's cash flow will be redirected to purchasing tokens through the lead market maker and replenishing the Kii rewards pool for validating and staking. Kii Global is committed to a non-inflationary environment where users can participate in a non-inflationary blockchain supported by the entire Kii Global ecosystem.

Three months after public launch, Kii Global will publicly report the cash flow from company operations and will make payments to our lead market maker with instructions to purchase KII in the open market and send the KII to the public address for Rewards. The KII will not be purchased all in one day, but rather throughout a longer period of time in order to prevent heavy price fluctuations. This operation will be performed quarterly.

Validator Limitations and Requirements

Unlike Bitcoin, Dash or other proof-of-work blockchains, the CometBFT consensus mechanism gets slower with more validators due to the increased communication complexity. Fortunately, the speed of KiiChain is still 300x faster than its proof-of-work counterparts. That being said, the blockchain can still easily support enough validators in order to keep the network completely decentralized.

On genesis day, the maximum number of validators in the open set will be set to 100. In the beginning, each validator will be required to post a minimum of 10,000 KII in order to transition a node into a validator and will be ranked by how much total KII is staked. The higher the rank, the higher the rewards. The total number of validators in the open set will be adjusted based on Kii Global's assessment of the network and participants in the non-active set.. The number of validators in the open set can be scaled to 300 validators without losing performance metrics, however, with 100 validators the network should still have a healthy ratio of decentralization to network performance. The number will scale to provide greater decentralization for when the blockchain transitions to open governance.

Becoming a Validator After Genesis Day

Kii holders who are yet to become validators can do so by signing and submitting a BondTx transaction. The amount of Kii provided as collateral must be 10,000 as a minimum. Anyone can become a validator at any time, except when the size of the current validator set is greater than the maximum number of validators allowed. In that case, the transaction is only valid if the amount of Kii is greater than the amount of effective Kii held by the smallest validator, where effective Kii include delegated Kiis'. When a new validator replaces an existing validator in such a way, the existing validator becomes inactive and all the Kii and delegated Kii enter the unbonding state.

Kii Corporate Validators

Kii Global will run a particular validator called The MasterNode Validator. In order to stake KII in the Masternode Validator, delgators will have to commit 150,000 KII, but will be compensated with minimum rewards via staking, adjusted via airdrops.

Penalties for Validators

To ensure protocol adherence, validators face penalties for any deviations, whether deliberate or accidental. Clear infractions include dual signatures at the same block height and round, or breaking the CometBFT consensus protocol's "prevote-the-lock" rule. Such violations lead to the forfeiture of the validator's status and the seizure of their bonded Kii, along with their share of the reserve pool's tokens, known collectively as their "stake".

There are instances when validators may become unavailable due to issues like network interruptions or power outages. If a validator fails to commit a vote to the blockchain more than a specified maximum number of times within a certain number of past blocks, they will be deemed inactive and lose a default penalty of 1% of their stake.

Some harmful activities may not leave clear traces on the blockchain. In these cases, validators can collaborate externally to enforce timeouts on these harmful validators, provided there's overwhelming consensus.

In scenarios where more than one-third of KiiChain's voting power is offline, causing a halt, or if a similar coalition prevents evidence of malicious acts from being recorded on the blockchain, a recovery is initiated through a hard-fork reorganization proposal.

Transaction Fees

Validators on KiiChain earn KII tokens as rewards for processing transactions. They have the freedom to set their own exchange rates and select the transactions they process, as long as they don't exceed the BlockGasLimit. The fees collected are shared with stakeholders who have bonded their Kii, distributed proportionally every ValidatorPayoutPeriod (default is 1 hour).

Kii token holders who entrust their voting power to other validators have to pay a commission to these validators. The rate of this commission is determined by each individual validator.

Incentivizing Hackers

KiiChain's security hinges on the robustness of its validators and the delegation choices of delegators. To promote early detection and reporting of security flaws, KiiChain motivates hackers to disclose successful breaches through a ReportHackTx transaction. This transaction essentially communicates, "This validator has been compromised. Please allocate a bounty to this address." Following such a breach, the affected validator and its delegators are rendered inactive. A default of 5% of everyone's Kii

(HackPunishmentRatio) is deducted, and an equal percentage (HackRewardRatio) is awarded to the hacker at the specified address. The validator must then restore their remaining Kii using a backup key.

To ensure this feature isn't exploited to illegitimately transfer unvested Kii, the ratio of vested to unvested Kii for validators and delegators before and after the ReportHackTx transaction will remain unchanged. The hacker's bounty will also include a portion of unvested Kii, if available.

This feature will come in particular use during Testnet and Testnet related competitions.

Governance Specifications

In the first 12 - 14 months , KiiChain will have closed governance in order to protect the integrity of the network in its infancy. Proposed changes to the network and the addition of smart contracts will be review by the internal development team to audit code and protect the network from malicious attacks.

When the network has filled its 100 validators in the open set, and the average validator has at least 12 months of experience protecting the server and offering the staking services to its delegators, the Kii Global team will begin the transition to open governance.

Open governance in KiiChain will be managed by a decentralized organization which relies on a formal governance process for coordinating updates to the blockchain. This includes adjusting system parameters, implementing software upgrades, and making changes to the constitution.

All validators must vote on each proposal. If a validator doesn't vote within the set time, they are automatically deactivated for the AbsenteeismPenaltyPeriod (default is one week).

Delegators' votes are automatically aligned with their chosen validator's vote, but they can change this vote manually. Kii that is not bonded does not have voting rights.

Proposals require a MinimumProposalDeposit in tokens, which can be Kii or other token types. The voters can decide to seize this deposit. If over half the voters opt to take the deposit (for instance, in the case of a spam proposal), it's added to the reserve pool, except for any Kii, which are destroyed.

Voting options for each proposal include:
- Yea
- YeaWithForce
- Nay
- NayWithForce
- Abstain

A proposal passes (or fails) if it gets more than half of the Yea or YeaWithForce (or Nay or NayWithForce) votes. However, a decision can be vetoed by more than a third of voters choosing a "with

force" option. If a majority decision is vetoed, everyone loses VetoPenaltyFeeBlocks (equivalent to one day's worth of blocks) in fees (excluding taxes), and the group that vetoed the decision also loses VetoPenaltyKii (default 0.1%) of their Kii.

Parameter Change Proposal
Any of the parameters defined here can be changed with the passing of a ParameterChangeProposal.

Bounty Proposal
Kii can be inflated and reserve pool funds spent with the passing of a BountyProposal.

Test Proposal
All other proposals, such as a proposal to upgrade the protocol, will be coordinated via the generic TextProposal.

Summary

In summation, CometBFT's technical architecture offers a comprehensive suite of advantages that make it the consensus algorithm of choice for high-stakes applications, including those deployed by KiiChain. It is the epitome of speed, security, and sustainability, effectively setting a new industry standard for blockchain consensus mechanisms. Combined with Kii Global's ecosystem of products and real-world business infrastructure, the entire Kii team is dedicated to building a better future for our close counterparts in Latin America, and everyone else in emerging markets.

Citations

Special thanks to our friends at Cosmos: https://v1.cosmos.network/resources/whitepaper
Tendermint: https://github.com/tendermint/tendermint
CometBFT: https://github.com/cometbft/cometbft
ABCI: https://github.com/tendermint/abci
—
Bitcoin: https://bitcoin.org/bitcoin.pdf
ZeroCash: http://zerocash-project.org/paper
Ethereum: https://github.com/ethereum/wiki/wiki/White-Paper
TheDAO: https://download.slock.it/public/DAO/WhitePaper.pdf
Lightning Network: https://lightning.network/lightning-network-paper-DRAFT-0.5.pdf
BitShares: https://bitshares.org/technology/delegated-proof-of-stake-consensus/
Ethereum Sharding: https://github.com/ethereum/EIPs/issues/53
Ethereum 2.0 Mauve Paper: http://vitalik.ca/files/mauve_paper.html