Kalima
Blockchain & IoT
Notarize and Monetize

Kalima Vision

The rapid transition from Web2 to Web3 is replacing centralized infrastructure and applications with decentralized infrastructures and dApps (decentralized applications). By 2025, 80% of data processing and analysis will take place in smart connected objects, such as vehicles, gateways, manufacturing robots, and computing facilities.

Whether it is for smart cities, supply chain, healthcare, or the energy sector, networks of connected devices will be used to collect, manage and analyze data, creating tremendous value for IoT and Big Data applications.

Kalima's goal is to provide a blockchain infrastructure to enterprises which will allow them notarize, tokenize and monetize data.

As infrastructure providers, it is paramount for Kalima to give absolute freedom, flexibility, and independent governance capabilities to those building on the network. Kalima being fast, cost-effective, low energy consumption, and highly scalable, users will be able to tailor our solution to specific needs, creating, expanding and improving their business models.

The Kalima protocol ensures the integrity of the data transmission and the immutability of the data storage and the possibility to monetize the data collected.

The Kalima protocol is particularly well designed for industries and companies using IoT data collection and storage with edge computing facilitated by client-side smart contracts.

André Charles Legendre
CEO of Kalima
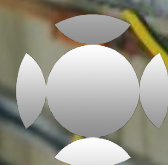
Kalima
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Summary

Kalima Blockchain

Everyday, massive amounts of sensitive data are collected and transmitted by IoT, Internet of Things, in the major industries.
Smart city, supply chain, healthcare industry, automotive industry... all these sectors use connected devices networks to collect, manage and analyse their data, it's the IoT.

Kalima was built to notarize and monetize enteprises data including IoT data to.

Kalima Blockchain ensures the integrity of the data transmission and the immutability of the data storage and the possibility to monetize the data collected.

KALIMA ECOSYSTEM : A NETWORK OF BLOCKCHAIN

Kalima Blockchain is an ecosystem composed of the **Kalima MainChain** and a decentralized network of **independent permissioned blockchains** called **Kalima PrivaChains**. It is a third generation blockchain, proposing a network of blockchains to its users as a new paradigm to achieve decentralization, independence and scalability.

The **Kalima MainChain** is a network of blockchains called **"Channels"**.

Each **Kalima PrivaChain** is independent with **its own governance and has the option to connect** with other Kalima PrivaChains, or with public blockchains such as Tezos, Lightning network and soon Polygon.

Kalima's network of blockchains is optimal for developers and businesses to adopt blockchain technology at a large scale. The fact Blockchains on the **Kalima Ecosystem** are **permissioned blockchain**, where only predetermined nodes can see the ledger and participate in the consensus, compliments the modular aspect with independent data governance, so that each PrivaChain is fully controlled by its owners.
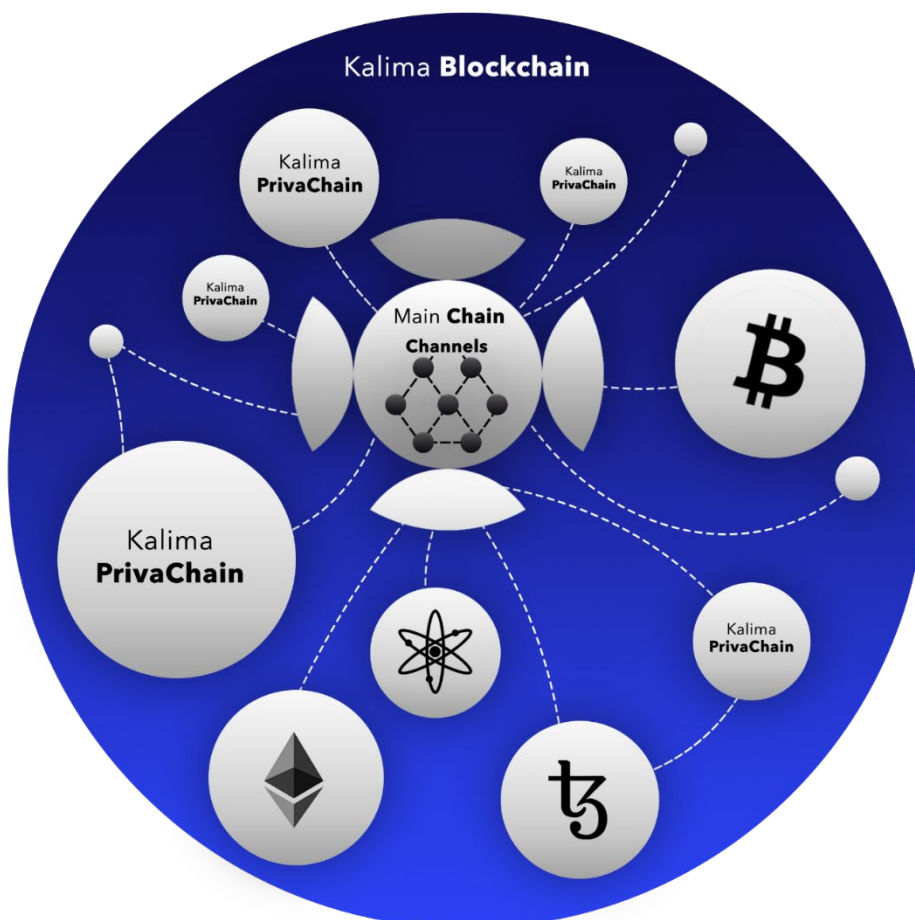
The multichain approach aims to solve transactions speed issues and bring smart contract on the edge for blockchains.

This opens an all-new world of possibilities for combining blockchain and IoT.

ENTERPRISE DATA GOVERNANCE SOLUTION

Designed for enterprises & IoT

Kalima was built to notarize, tokenize and monetize data for enterprises including IoT systems.

Thanks to the modularity of the Kalima protocol, the PrivaChain building process is fit for an independent notarization, tokenization and monetization of data for any enterprises.
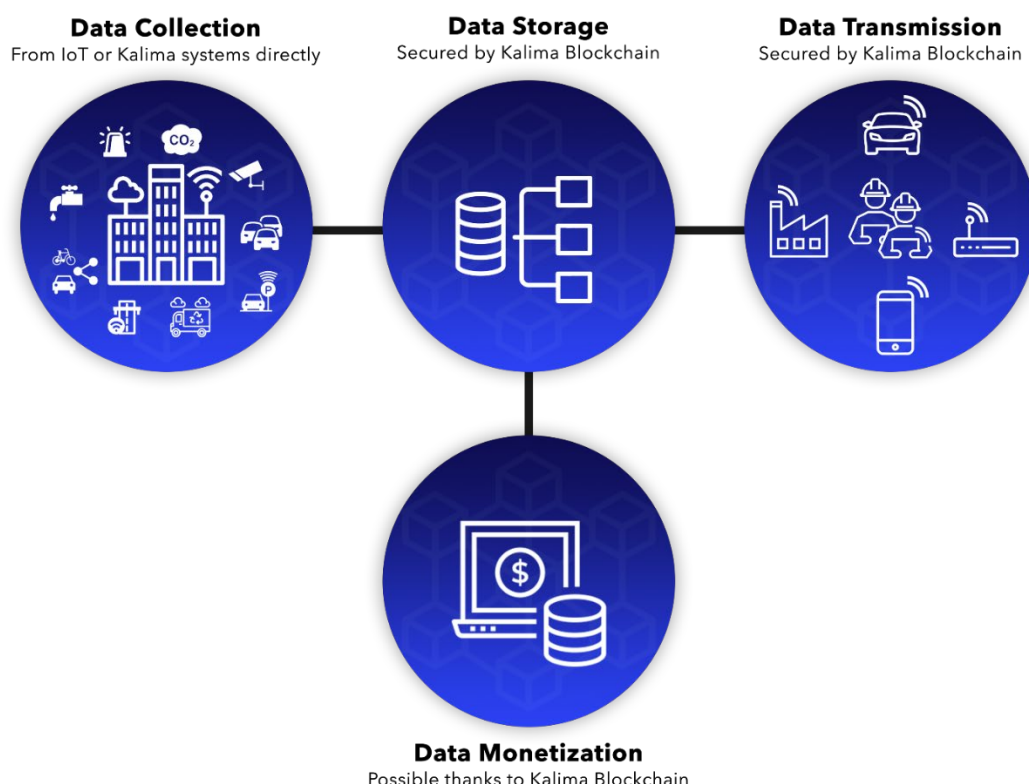
Examples of Kalima blockchain use case :

1. An alarm is triggered on a nuclear power plant which has its own Kalima PrivaChain
1. Data is immediately collected from the sensors and secured on the PrivaChain.
2. The data is quickly transmitted to a client nodes connected to the alarm, allowing a very rapid processing thanks to Kalima's low latency.
3. All the crucial data is secured end-to-end by Kalima.

2. A smart building owner wants to monetize its data thanks to Kalima
1. The building is equipped with gateways collecting environmental (or other) data.
2. The connected gateways notarize the data to the PrivaChain.
3. From here the company can tokenize and monetize its data via an oracle, independently or using the Kalima Marketplace, all while using its proprietary token or the KLX, Kalima's native token

Data Collection
From IoT or Kalima systems directly

Data Storage
Secured by Kalima Blockchain

Data Transmission
Secured by Kalima Blockchain

Data Monetization
Possible thanks to Kalima Blockchain

KALIMA IS CURRENTLY
THE MOST POWERFUL IOT BLOCKCHAIN

Mature & Scalable

Kalima blockchain is already used and approved by many industries since few years.

Client Side Smart Contract

Guarantees more scalability, safety and freedom to the parallel chains.
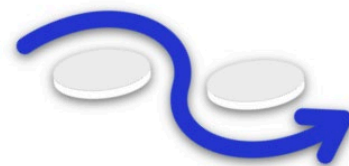
Fast & Secured

Optimized to reduce delay. Latency lower than 1s. 1000 tx / second / blockchain.

Low Energy

Memcached, heartbeat, a unique tx/block are developed to reduce energy consumption.

PrivaChains

Kalima Ecosystem is composed of independent public chains and private chains, the PrivaChains.

KALIMA PROTOCOL
An ecosystem of decentralized permissioned blockchains

Kalima Blockchain has been **designed from scratch to meet the requirements of modern data**, including data from the Internet of Things.

Kalima provides its users with the unique feature of **client-side smart contracts,** enabling its users to independently customize the smart contract models governing their PrivaChains, with the opportunity of integrating AI models within smart contracts.

Kalima Blockchain's **low latency** enables real time data transactions, all the while having an exceptionally **low environmental impact,** with a **very low transaction cost.**

Possessing a very small memory and CPU footprint, **Kalima can be embedded in small IoT devices**. This entails that **Kalima Smart Contracts are executed at the edge**, where the majority data is generated, limiting data clustering and improving scalability. Kalima acts as a **second layer blockchain for Tezos, Lightning network**, and soon Polygon.

Kalima Blockchain provides data lakes which expose authorized data from one or several blockchains to run different types of analytics, dashboards, visualizations, statistics, big data processing or machine learning to have a clear vision on your data.
Kalima client nodes can run in mobile device (iOS/Android) and in small form factor IoT gateways.
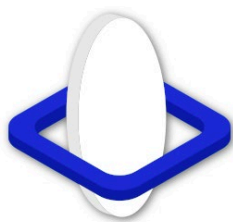
Embedded
Embedded Kalima Blockchain in small IoT devices for an end-to-end blockchain communication.
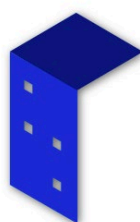
Open SDK
Allows developers to build Dapps in simple languages:
Java, C#, C, Java Script, Python...
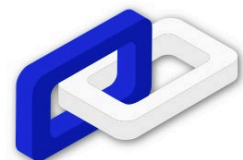
Multichain
Kalima Blockchain is interconnected with major blockchains:
Tezos, Ethereum, Bitcoin, Cosmos.

Build a decentralized IoT network with gateways powered by Kalima Blockchain

Kalima Blockchain is installed on IoT gateways including LoRaWAN gateways around the world to create a new decentralized IoT network providing real world qualified data to the Kalima ecosystem.

Join Kalima and take part in this new decentralized IoT network to provide and monetize your data to the world.

BLOCKCHAIN FOR IOT & ENTERPRISES MARKET PROJECTION

"In terms of revenue, the global demand for Blockchain IoT market stood at USD 62.39 Million in 2019 is expected to reach USD 14,165.87 Million in 2028 at a CAGR of 86.5% between 2020 and 2028. "

Zion Market Research

Blockchain and IoT Software market revenue projection
(ZION Market research)

	2020	2021	2022	2023	2024	2025	2026	2027	2028
Software	51,10	85,59	148,56	267,05	494,70	943,76	1 836,	3 613,	7 166,
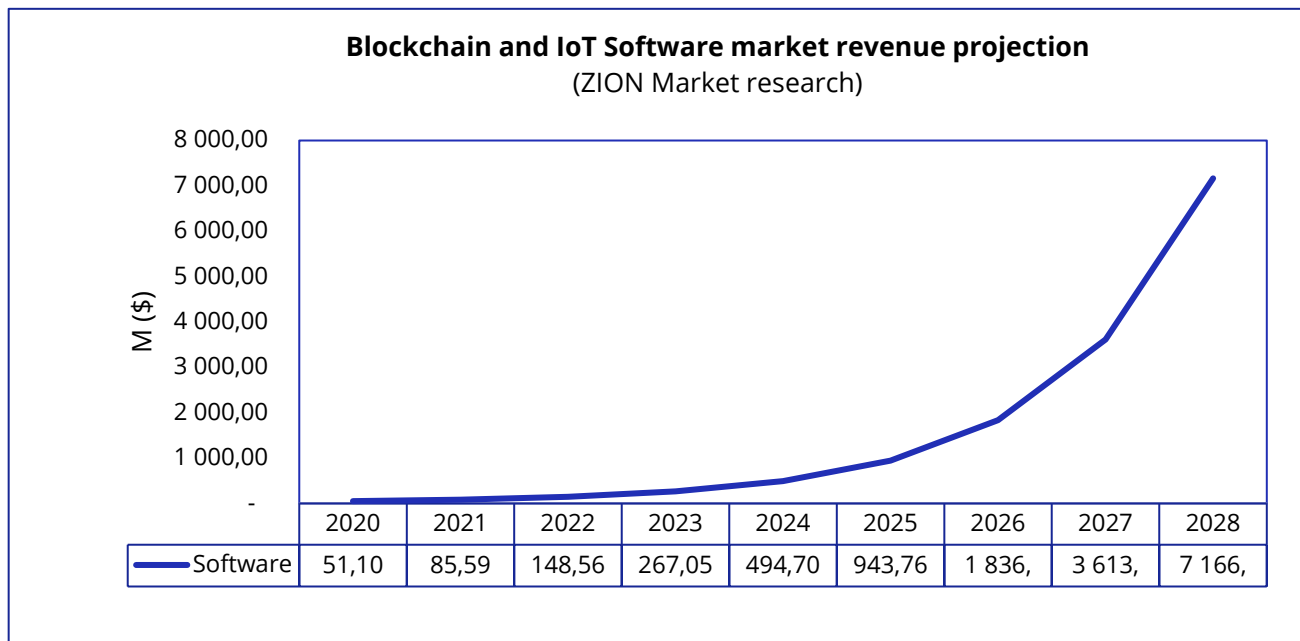
Blockchain for enterprise, 2018-2030
(Gartner)

Phase 1: Irrational exuberance, few high profile successes

Phase 2: Larger focused investments, many successful models

Phase 3: Global large-scale economics value-add

Business Value   Growth
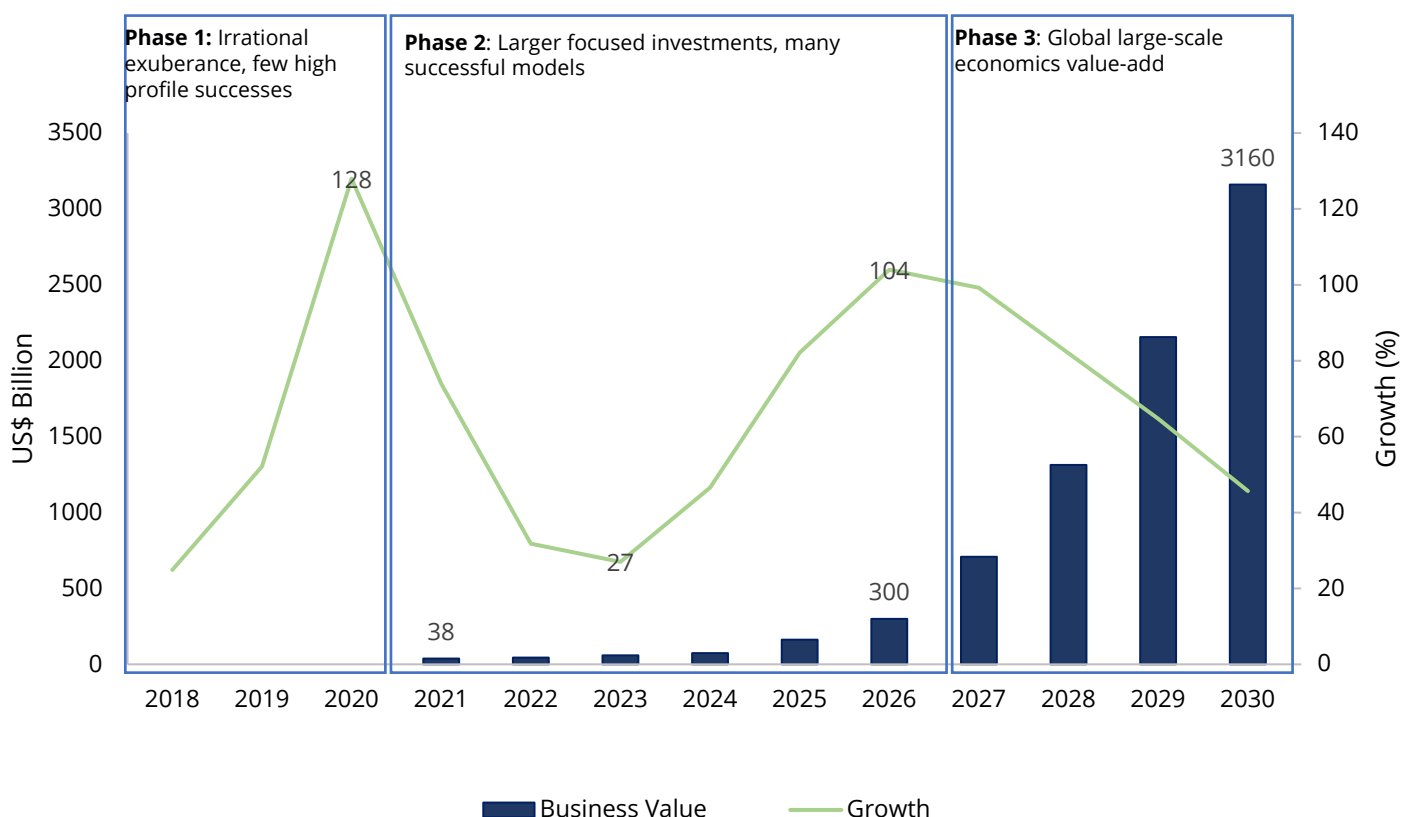
WHERE DAPPS CAN TAKE ADVANTAGE OF KALIMA CLIENT-SIDE SMART CONTRACTS

Kalima's functionalities allow developers to create dApps dedicated to Enterprise including IoT applications in **a multitude of sectors**.

Digital passport

A digital passport of your equipment is primarily an authenticity certificate or NFT, completed by a temper proof and secure storage of all data history of your equipment. There are digital passport applications in the Healthcare, Pharmaceutical, Luxury, Building, City, Aggrotech, Food and Beverage industries.

Digital twin

A digital twin of your equipment gives you a real time image of your equipment, allowing virtual product and asset manipulation. Applications exist in Supply Chain, Healthcare, Infrastructures, Insurances, Building, City, Aggrotech and smart economy industries.

Pay per use, utility token

Manufacturers and Users of machines receive transparent information through Kalima to allow pay per use. Use measurement is translated in utility token quantity.

Asset tokenization

Asset tokenization opens doors to many new business models, with asset tokenization platforms bringing together sellers and buyers. Arts, Movies, Luxury, Metaverse, Infrastructures, Real Estate, new mobility and smart economy industries will all be heavily influenced by asset tokenization.

Payment token

Smart rewarding systems and monetization in P2P applications are paramount to creating value within the ecosystem. Payment tokenization is now synonymous with ease of use, trust and security, it being one of the best data protection methods that can be integrated into the different payment ecosystems. The benefits it brings to sellers and consumers have enabled it to spread quickly with low transaction costs.

NPK

36.2 °C

Humidity

Kalima
Blockchain & IoT
Notarize and Monetize

A NEW POSSIBILITY TO MONETIZE DATA

Kalima's goal is to become the standard for Blockchain Enterprise applications, its protocol facilitate data's notarization, tokenization, and monetization.

Kalima empowers enterprises and developers to build the next generation of sustainable blockchain applications building bridges between the physical and the digital world. Kalima client nodes can run in mobile devices (Android an iOS) and in small form factor IoT devices or gateways.

Kalima provides real time data for a distinguishingly low environmental impact along with a very low transaction cost.

TOKENIZATION : AN OPPORTUNITY FOR ENTERPRISES

Kalima wants to help businesses and developers create their own token designed for their business model inspired by their ideas.

Kalima will allow to deploy your own custom token to monetize your business models converting physical data into a liquid token tradable in the community. All smart contracts created by the community of developers will use the technical standard token form of Kalima Ecosystem known as "KL20". This standard defines a common list of rules for all Kalima tokens such as the name, symbol supply and how transactions are approved and how they can be transferred.

NFTs ON KALIMA ECOSYSTEM

Kalima will provide tools to create NFTs and build unique digital assets that represent a proof of ownership. From art and digital collectibles to real estate, NFTs can extend physical assets.
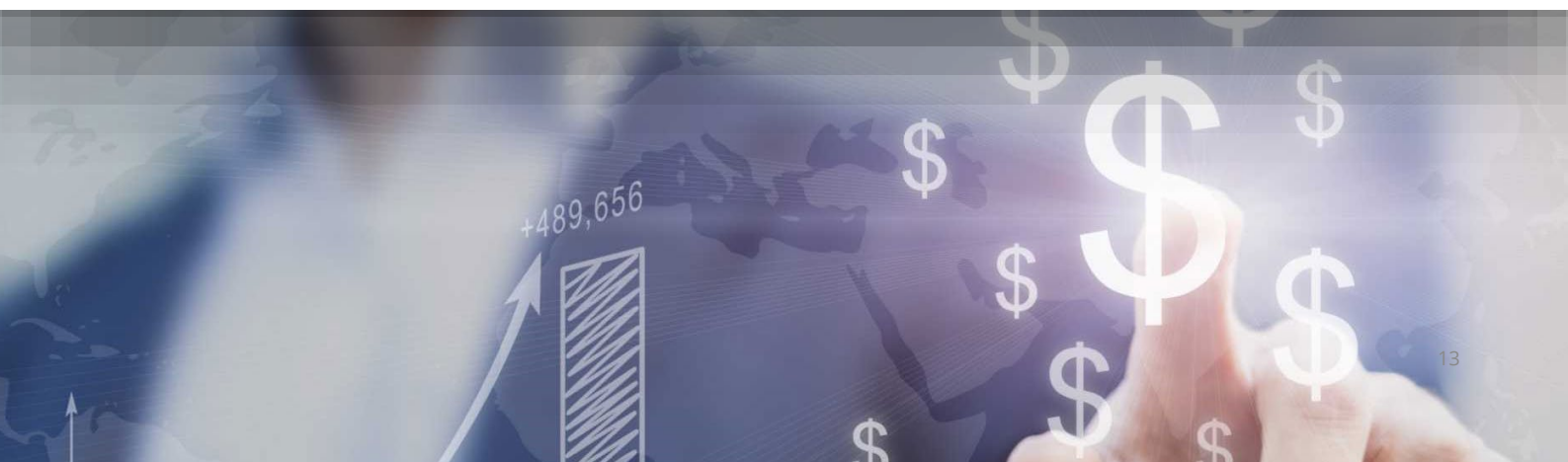
BUILDING DAPPS ON KALIMA ECOSYSTEM

Giving you the tools you need to build your DApps on Kalima Ecosystem

OPEN SDK USING STANDARD LANGUAGES

The Kalima SDK is the tool to build and test DApps on the Kalima ecosystem. Kalima SDK uses standard languages Java, C#, C, Java Script, Python and is compatible with Linux, Windows, Android, iOS and Mac OS.

Multichain

Kalima has multichain capabilities with Tezos and Bitcoin (through the Lightning network) and soon Ethereum (through Polygon) to offer a hybrid private/public blockchain solution.

TOKENIZATION PLATFORM

The Tokenization platform is our tool to deploy your own token on your Kalima Privachain. This will help entrepreneurs to develop new business models and financing methods by creating custom token dedicated to their own project.

DEPLOY YOUR OWN KALIMA PRIVACHAIN

Launch your own Privachain quickly and easily for a low cost. Build a next generation multichain network scalable for business and industrial applications.

CREATE YOUR OWN GOVERNANCE FOR YOUR NETWORK

You have full control on your governance choices.

BRIDGE (OR NOT) WITH OTHER BLOCKCHAINS

You can connect with other galaxies of blockchain and public blockchains. Bring network together and create value with interconnection.

KALIMA API: APPLICATION PROGAMMING INTERFACE

Kalima, APIs are designed to be extremely usable, so that a relatively unskilled developer can write code on top of Kalima Blockchain without too much trouble.

API are open source to warranty the openness of the project. Core of Kalima technology source code is available only to "Consortium Members" now as a way to protect against uncontrolled forks which could complexify the governance and create security issues, but its governance, "Kalima Blockchain Consortium", could change this in the future.

DAPPS STORE AND ECOSYSTEM PRINCIPLES

The Kalima ecosystem aims to enable the development of multiple dApps. Each developer can use the Kalima tools to develop their application based on a Kalima Privachain, interacting or not with Tezos, Lightning network and Polygon.

KALIMA MARKETPLACE

DApps developed on the Kalima ecosystem can be published on the Kalima marketplace to make them available to the community. This Marketplace will be used to browse through the dApps created by Kalima developers.

Creators of dApps can create their own economic model; they have the choice of offering free or paid services.
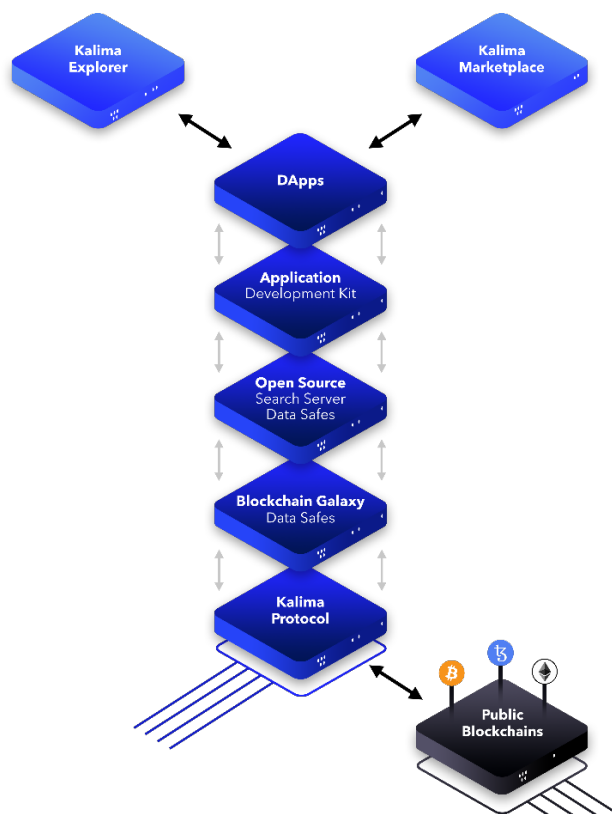
DIFFERENT TYPES OF NODES
Kalima ecosystem consists of 6 different types of nodes

1. Master Nodes (full nodes)

Master nodes are the main element in charge of validating transactions in the Kalima blockchain, they ensure traceability, integrity and immutability of all transactions. You can install as many master nodes as you need to set up a Kalima Privachain with a minimum of five of them. Master nodes store blockchain data and they publish them to the client's node after validation. Master nodes are the only nodes with administration nodes that are authorized to access all the data contained within the blockchain, including authorization data.

2. Validation Nodes

Validation nodes participate in the consensus to elect the Leader Node in charge of timestamping and hashing of all transactions. Validation nodes and master nodes are in charge of controlling transactions integrity and blockchain data immutability

3. Administration Nodes

Administration node give authorizations to the client nodes. All nodes benefit from strong device identification. Devices must be authorized before any connection is made. Authorizations can be limited to a subset of data.

4. Voting Nodes

Voting nodes enable validators to vote for governance management choices and to confirm loging access to administration nodes in a multi signature way. They are also used by "Stakers" for "Staking" purposes. Each "Validator" owns one "Governance voting node". Each "Staker" owns one "Staking voting node".

5. Client Nodes

Client nodes synchronize data to which they are authorized from Master Nodes, create new transactions and execute smart contracts. Client nodes can add and receive data to and from the blockchain depending on their authorizations. Smart contracts are executed in the client nodes on data arrival. Smart Contracts must have been controlled and authorized by Validation nodes before being executed. Client nodes can be developed by our users and partners with the help of Kalima SDK. Kalima SDK provides tools to develop java, C#, C, NodeJS, Android and iOS client nodes.

6. Data lake and Data safe Nodes

Data Lake and data safe nodes are Client nodes which collect data of one or multiple blockchain, depending on the authorizations, to compile and publish them to facilittae data search, machine learning, statistics or to provide a highly secure storage.

Tokenomics

To power this ecosystem, we designed the Kalima KLX token. This token is the native currency of the Kalima ecosystem and can be considered as the cryptographic fuel of the ecosystem. It is the key for developers, companies and investors to build and participate in project development and funding of dApps on the ecosystem.
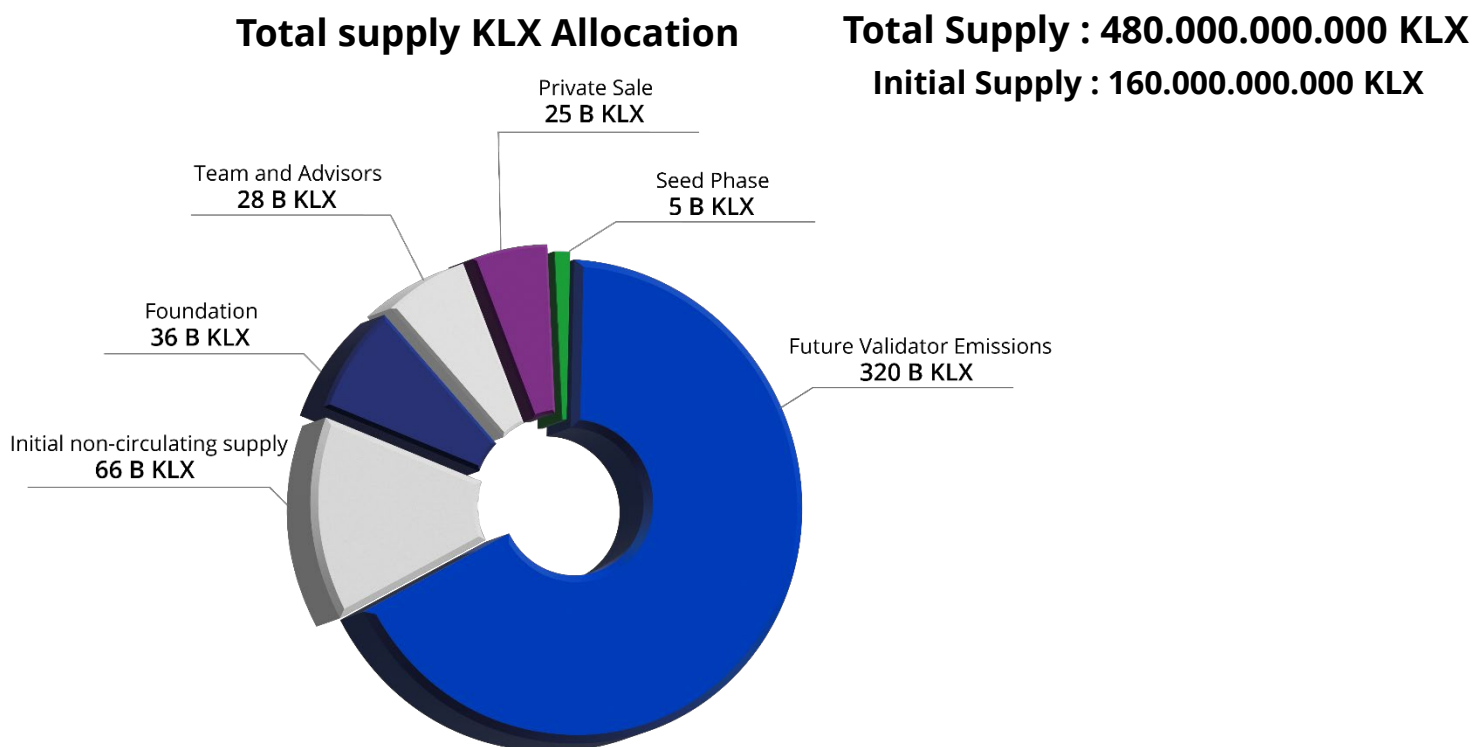
The KLX token will be used on the Kalima Store Marketplace to use dApps and purchase community-developed services.

Users will be able to transfer their KLX with Kalima's mobile payment apps and exchange them with Tez, BTC and ETH. KLX holders will have active participation in the community by being able to participate in project development, purchase services and vote for project funding.

TOKENOMICS – TOKEN ALLOCATION AND VESTING

The Kalima token, **named KLX**, is the backbone of the network. The KLX is the currency used to monetize Dapps built on the Kalima network and to pay transaction fees. The KLX will first be an ERC20 Token and will become a native KL20 token this process is call « the Birdge » in Kalima.

What is the token allocation for Kalima (KLX)?

Total supply KLX Allocation

Total Supply : 480.000.000.000 KLX
Initial Supply : 160.000.000.000 KLX

Private Sale
25 B KLX

Seed Phase
5 B KLX

Team and Advisors
28 B KLX

Foundation
36 B KLX

Future Validator Emissions
320 B KLX

Initial non-circulating supply
66 B KLX

Initial Token allocation : First 160.000.000.000 KLX

Allocation	KLX	Vesting
Seed Phase	5.000.000.000	18 Months
Private Sale	25.000.000.000	24 Months
Team	19.800.000.000	24 Months of Vesting with 12 Months of Cliff
Advisors	8.200.000.000	18 Months of Vesting with 6 Months of cliff
Reserve	66.000.000.000	Managed by the DAO
Foundation	36.000.000.000	Managed by the DAO

TOKENOMICS

Kalima Network

The Kalima Network is a decentralized network with a community-based governance. It is composed of the network of blockchain, the Kalima MainChain with its channels and the Kalima PrivaChains, validation pools, Master Nodes and Validation nodes.

Kalima Governance

Kalima aims to govern its ecosystem under the form of a DAO, a blockchain-governed organization working towards making Kalima function and evolve optimally, with the KLX as its utility token.

KLX – Foundation

KLX tokens allocated to the foundation are used to sustainably deploy the resources to support the long-term success of the KLX.

The objective of the foundation is to protect holders of the KLX and ensure that the independent organizations and developers on Kalima ecosystem can get resources to build on kalima and develop the ecosystems.
These tokens will be used to provide grants and manage the burn of the KLX

What is the KLX Supply Release Schedule?

The KLX will reach its total supply of 480.000.000.000 through the years via two means:

The **Initial Supply Release**, and **Future Validator Emissions.**

Within the Initial Supply, there will be a circulating supply and a non-circulating supply :

- **The Circulating Supply** is the amount of KLX that is currently circulating across CEXes, DEXes and user wallets, and includes both staked KLX, and unstaked KLX.

- **Non-circulating Supply** takes two main forms. It can either be KLX that is locked in a stake account (investment in KLX, foundation grants), or KLX that is also kept in stake accounts but is not locked.

With time, the non-circulating supply will be released and counted as circulating supply.

TOKENOMICS – Initial supply

Initial Supply Release Schedule

Initial Supply Release : 160 000 000 000 KLX

As the name indicates, there will be an initial number of KLX that will be put into circulation, and another that is considered non-circulating

1. **The Initial Circulating Supply : 94 000 000 000 KLX**

   • Team and Advisors : 28 000 000 000 KLX

   • Seed and Private Sales : 30 000 000 000 KLX

   • Foundation : 36 000 000 000 KLX

2. **Reserve : 66 000 000 000 KLX**

These tokens are considered non-circulating at the start of the project and are managed by the DAO to ensure :

• Compliance with European cryptocurrencies regulations in terms of liquidity of the token

• Exceptional expenses.

These tokens will not be used or sold by the foundation on a regular basis and the foundation commits to not use more than 4.000.000.000.000 KLX per year from the reserve.

KLX initial Supply schedule (in Million KLX)
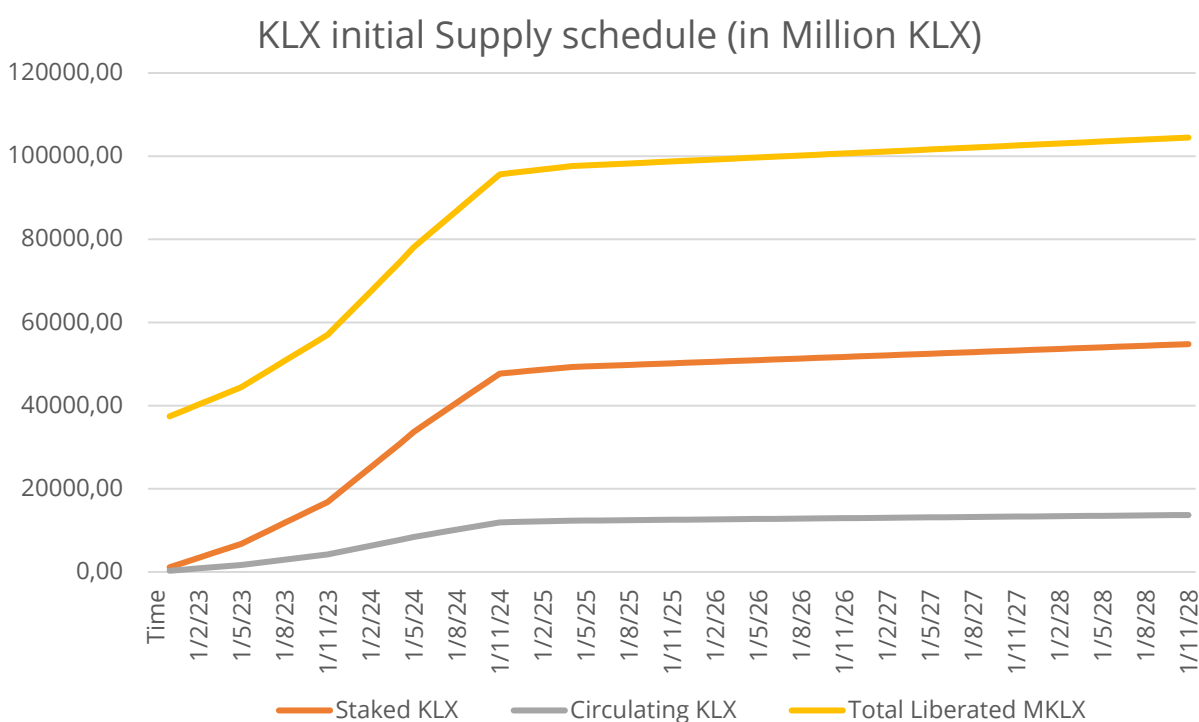
TOKENOMICS – Future validator emissions

Future Validator emissions release Schedule

Future Validator Emissions : 320 000 000 000 KLX

As the Kalima Protocol enables high scalability for its ecosystem, its tokenomics takes into account the potential for a high number of deployed PrivaChains.

With each PrivaChain requiring multiple Validator and Master nodes, a planned 320 billion KLX will count as Future Validator Emissions for the rewarding of Validators.

Validators, including Master nodes will be rewarded in KLX for every transactions they validate in the network. Validation rewards will be divided by 2 after every halving, occurring every time 16 billion KLX tokens are emitted, up until the maximum limit of 480 billion KLX is reached.

At the time of the KLX launch, the reward per validated block will be of 0,098 KLX for a Master node and 0,002 KLX for a validation node. The first halving will take place after the emission of 16 billion KLX tokens, whereby the reward per bloc will be divided by 2.

PRE-BRIDGE STAKING

What is the pre-bridge staking ?

KLX holders will be able to stake their tokens before the bridge of the KLX token from the ERC20 standard to the native KLX standard. The bridge is scheduled for Q1 2024. Staking ERC20 tokens will help build and secure the Kalima Network, creating a robust staking pool ahead of the launch of the Kalima MainChain.

Between February 2nd, 2023 and the date of the bridge – scheduled for Q1 2024 – KLX holders will be able to stake their tokens in the "Pre-Bridge staking" program. The longer the tokens are staked, the bigger the reward will be, with a maximum return of 10%, for a maximum staking period, i.e. from February 2nd to the day of the launch of the bridge.

The rewards will be distributed monthly for 12 months from the bridge.

Tokens that aren't staked before the bridge will not bring any reward.

A few days before the bridge, a snapshot of the KLX staked on the Polygon network will be made, in order to freeze all the addresses that have saked KLX. The addresses present at the time of the Snapshot (all the addresses declared in staking and the amount of KLX stake on each address, which will determine the amount of rewards for each staker.

Each reward installment will be rounded down to the nearest KLX, e.g. for a monthly reward installment of KLX 10.06, a staker will receive KLX 10.

If ever the date of the Bridge is delayed, stakers will receive their rewards a maximum of 18 months after February 2nd 2023, i.e. the August 2nd 2024. In this case from August 2, 2024 the staking rewards will be distributed with a maximum yield of 10% for people who have staked since February 2nd 2023.

At the end of the pre-bridge staking, token staked will be transfered to the standard staking program and holders will be able to claim them at any time.

How to participate in the pre-bridge staking

To participate in the pre-bridge staking, a KLX holder will simply have to declare "a staking address" on the Kalima website. A staking address is a polygon address holding ERC20 KLX.

To declare the staking address you will simply have to enter your polygon address on the Kalima website.

The reward will be calculated on the amount of KLX left you have from the moment you staked your KLX plus eventual additional KLX tranfered to this adress. Remember that Tokens that aren't staked before the bridge will not bring any reward.

Stakers will be able to sell their token at any time, tokens are not locked on the staking address. If a staker chooses to sell 50% of the tokens he holds on his staking address before the bridge, then the reward will only be calculated on the tokens he still holds at the time of the bridge.

Stakers will also be able to transfer more KLX to their staking address at any time to increase the number of staked tokens, and therefore the associated reward.

Be careful, if you declare a staking address on Kalima, any token transferred to another address will no longer count as staked tokens when calculating rewards. In other words, if you declare a staking address on Kalima, only the tokens present on this address will be taken into account when distributing your reward.

STAKING MODEL

What is staking?

Staking is the process of locking KLX tokens on the chain as a mean of securing the entire Kalima network.

The Kalima Blockchain is a Delegated Proof-Of-Stake (DPoS) blockchain. KLX tokens can be self-delegated directly by a validator or a Validation Pool or delegated to a Validation Pool by KLX holders (delegators).

What are Delegators?

Delegators are KLX holders who cannot, or do not want to, run a validator themselves. KLX holders can delegate KLX to a validation and obtain a part of their revenue in exchange.

For details on how revenue is distributed, see "Validation Pools- Rewards and Delegation" in this document.

Become a staker on Kalima

When a KLX holder decide to delegate, his KLX will be randomly split between the different Validation Pools. In other words, delegators will not choose themselves the validation pool in which they want to delegate their KLX. The Kalima Protocol will attribute each stake in a random way. This mechanism will help the decentralization in the network and will prevent one validation pool to have too much staking power and centralization in the network.

Epoch

An epoch is a specific period of time in the blockchain. In Kalima an epoch is a period of 2 days .Epochs can be considered as a calendar for Kalima blockchain. Epoch are used to deliver rewards for validators and satkers.

Staking Rewards

Validators who produce a block are rewarded with token. They share rewards with their delegators (see block reward example in this document). Both validators and delegators can stake their tokens on-chain and receive staking rewards at the end of each epoch. The staking system pays out rewards equally to all validator pools regardless of the total stake. This avoids the centralization of power to a few validators. In other words, the rewards are equally distributed between validator pools. But within each pool, rewards will be proportionally distributed between stakers (or delegators), with regard to their stake.

KALIMA VALIDATORS

Following the Kalima consensus, each validator must validate all blocks and they all must be validated in respect with their time of arrival. The same reward is given to all validators for all block validations. Validators are in charge of producing correct validation hash in time.

In return for their validation work, they receive <u>rewards</u> :

- 0,098 KLX is emitted every block in each blockchain for master nodes

- 0,002 KLX is emitted every block in each blockchain for validation nodes

Should they not comply with the consensus algorithm (incorrect hash, or delayed validation), they will face a penalty by seeing their right to validate transactions taken away temporarily.

Becoming a validator requires some technical skills in security, hardware requirements, as well as trust and support from the community, in the form of stake.

Types Of Validation Nodes

There are 2 different validation nodes you can opt for:

Validation Nodes

Validation nodes oversee controlling transactions integrity and blockchain data immutability. Simple validation nodes don't have to store the ledger. Validation Nodes validate and timestamp transactions.

Validation nides are in charge of producing correct validation hash in time to control the hash produced by Leader node.

Validation nodes ensure traceability, integrity of all transactions

Master Nodes

Master Nodes are special validation nodes. They are the main validation nodes of the consensus; they are in charge to elect the Leader Node.

Master Nodes must store a full copy of the ledger to ensure traceability, integrity, and immutability of all transactions.

Master nodes store blockchain data and they publish them to the client's node after validation.

Master nodes are the only ones with administration nodes authorized to access all the data contained within the blockchain, including authorization data.

Each Kalima Blockchain governance can install as many master nodes as required with a minimum of five of them.

KALIMA VALIDAITON POOLS

What are Validation Pools?

Validation pools operates several Validation nodes and several Master nodes on the network.

Their role is to run Master Nodes and Validation nodes for the Kalima Mainchain channels and also for the PrivaChains that want to delegate the operation of their validation nodes.

How are they organized ?

At the launch of the network there will be a maximum of 100 validation pools. Kalima Blockchain will manage a validation pool.

The Validation pool Owner owns the Validation pools and has the choice to administrate himself the Validation pool or to delegate to a third party the administration of the Validation pool and the operation of the Master Nodes and Validation nodes.

Validation Pool cannot manage several nodes of the same Channel or Privachain for security reason.

What are the requirements for a Validation Pools?

To open a Validation Pool, the Pool must buy an amount of $30.000 of value in KLX

These KLX are required to open a validation pool

To run Master and Validation nodes, the pool must use a certain amount of KLX staked by the Network :

- To run a Master node on a Validation Pool, the Pool must have a stake from the network of minimum 40.000.000 KLX per Master Node
- To run a Validation node on a Validation Pool, the Pool must have a stake from the network of minimum of 4.000.000 KLX per Validation Nodes

Rewards for Validation Pools

Validation pools receive rewards for their validation work in two forms:
1. New KLX emitted each transactions

- 0.098 KLX is emitted every block for Master Nodes
- 0,002 KLX is emitted every block for Validation Nodes

This number of KLX will decrease following the halving mechanism.

2. Transactions fees
- 12% for the Master Nodes
- 12% for the Validation Nodes
- 5% for the Validation pool Owner (in case of total delegation of its pool)

PRIVACHAIN VALIDATION & MASTER NODES

Conditions for deploying a Privachain

To deploy a PrivaChain on the Kalima blockchain, the PrivaChain holder must create a set of Master Nodes and Validation nodes. The creation requires a payment to the Kalima foundation from the PrivaChain holder. This payment corresponds to the cost of setting-up the PrivaChain and the deployment of the nodes to ensure best performance on the chain, each project having full independence and high degree of customization.

The cost of a PrivaChain will then depend on the number of nodes PrivaChain want to have on their network.

- The cost for a Master node is: 8.000.000 KLX
- The cost for a Validation node is: 2.000.000 KLX

A Privachain can choose to delegate its validation and master nodes to Validation Pools or to delegate to independent Master nodes and validation nodes.

PrivaChain Validation nodes operated on the Kalima Network

In the case where the PrivaChain governance wants the network to operate its validation nodes, it will ask several Validation pools to manage its Master Nodes and validation nodes.

Revenue received by a validator's pool is split between the validation pool and their delegators. The validation pool applies a commission on the part of the revenue that goes to their delegators.

PrivaChain Validation nodes delegate to independent Master nodes and validation nodes

In the case where the PrivaChain governance delegate validation to independent Master nodes and validation nodes, the Privachain governance define the setup costs that must be paid in a contractual base with Master nodes and Validation nodes managers.

MAINCHAIN CHANNELS VALIDATION & MASTER NODES

Channels Master nodes and validation nodes are managed by the network in the validation pools.

To run Channels Master nodes and validation nodes, the validation pools will have to meet the minimum stake required to run these nodes.

REWARDS AND PENALTIES FOR VALIDAITON POOLS

Rewards for Validation Pools

Validation pools receive rewards for their validation work in two forms:

- 0,098 KLX is emitted every block for master nodes

- 0,002 KLX is emitted every block for validation nodes

This number of KLX will decrease following the halving mechanism.

Block rewards are equally distributed among Pools.

Block rewards in each pools are distributed proportionally to all delegators relative to their stake. This means that even though each delegators gains KLX with each reward, all validation pools maintain equal weight over time.

Penalties

For validation pools, who have failed to validate a block in due time, have purposefully wrongfully signed a block or tried to harm the network in any way, a penalty will be applied.

The validation will see his right to reward taken away for 10.000 transactions.

In case of frequent failures DAO can decide definitive exclusion of a validation pool.

Halving effect on validator rewards

As previously mentioned, KLX validator rewards are subject to a halving effect, which is a key mechanism within the Kalima ecosystem.

KLX Validation rewards will be divided by 2 after every halving, which occurs every time 16 billion KLX tokens are emitted up until the hard cap of 480 billion KLX in circulation KLX is reached. Note that the initial supply of KLX is 160 billion tokens.

GAS FEES ON KALIMA BLOCKCHAIN

Gas fees on Kalima Blockchain

Each transaction carried out on the Kalima network will generate gas fees.
These fees remain very low within the Kalima ecosystem and have an essential role.

• Provide compensation for network validators for the necessary resources required for validating transactions, as well as storage
• Reduce and prevent network spam by introducing a real cost for transactions.

For this purpose, a gas fee system is set up on the Kalima blockchain which will be applied to each transaction.

The gas fee will be 0,00025 € per kb for each transaction.
Transaction fees, or gas fees, will be distributed as follows :
  • 25% are allocated to the Kalima Foundation to guarantee the security and proper functioning of the network
  • 1% is allocated to burn reserves to control inflation
  • 30% are allocated to validaiton pools.
  • 44%, the remaining share, is allocated to a special fund to provide grants to dApps and PrivaChain creators to encourage network development.

The gas fee amount, as well as the way they are distributed are subject to future changes carried out by the Kalima consortium as a mean of supporting the ecosystem by guaranteeing a fair revenue for validators alongside a small enough cost for users.

Gas fee payments

A payment will have to be made by the PrivaChain owner every 1000 transactions occurring on it. This payment to the Kalima MainChain will entail a cost of à 0,00025€ .

The payment frequency will be divided by 2 every time the minimum required amount of tokens held for owning a PrivaChain is doubled.

For example, if the amount held is of 200 million KLX (4x the minimum required amount), the payment frequency will be of 1 every 4000 transactions (4x base frequency).

A minimum of 1 such payment will be implemented per day to the Kalima MainChain in the case where a PrivaChain realizes less than 1000 transactions on a given day.

BURN ON KALIMA BLOCKCHAIN

Burn provisions on Kalima MainChain

The Burn mechanism is the process in which KLX tokens are bought back and removed from circulation which reduces the number of KLX in use.

A 1% burn provision will apply on each transaction fee occurring on Kalima Blockchain as to complete halving effects as well as maintaining inflation to a stable level. This means 1% of each transaction fee will be accumulated until it becomes necessary for a burn to occur.

For example, a 5Kb transaction representing a gas fee of 0.00125€, will trigger a burn of 0.0000125€ value in KLX.

The burn mechanism does not have any effect on the total supply which will keep a maximum circulating supply of 480.000.000.000 KLX.

REWARDS FOR PRIVACHAINS

Rewards for Privachains

As a mean of bootstrapping the Kalima network, the first 1084 PrivaChains will benefit from obtainable rewards once deployed.

For this, 10 reward levels have been put in place, rewarding further earlier PrivaChains.

These rewards will be distributed according to the following table.

REWARDS FOR PRIVACHAINS

Level	Number of Privachain	KLX Reward / Privachain	KLX Total Reward	Vesting
1	10	200 000 000	2 000 000 000	No Vesting
2	15	133 333 333	2 000 000 000	6 months
3	22	90 909 090	2 000 000 000	12 months
4	33	60 606 060	2 000 000 000	18 months
5	49	40 816 326	2 000 000 000	24 months
6	73	27 397 260	2 000 000 000	24 months
7	109	18 348 623	2 000 000 000	24 months
8	163	12 269 938	2 000 000 000	24 months
9	244	8 196 721	2 000 000 000	24 months
10	366	5 464 480	2 000 000 000	24 months
TOTAL	**1084**	**20 000 000 000**	**20 000 000 000**	**24 months**

Each PrivaChain can obtain 100% of the reward of from its respective level.
It is by realizing transactions on its PrivaChain that rewards will be unlocked.

For every 100 transactions realized on a PrivaChain, 1 KLX will be emitted, until that reward ceiling is reached for that level.

A reward level is unlocked only if the number of active PrivaChains goes past the required threshold for that reward level.
A PrivaChain is considered active when a minimum of 1000 transactions are realized on it per day.

For example, for the reward level 1 containing the first 10 PrivaChains, 1 single PrivaChain can realize 200 000 000 000 transactions so as to obtain the total of rewards available for the level in which it finds itself.

For every level, apart from the first one, the emitted KLX will be subject to a vesting period specified above.

KALIMA MAINCHAIN RULES

We have listed below the initial governance rules of the Kalima MainChain. Theses rules are subject to change in the future by vote of the KLX ecosystem :

When the KLX migrates to its native chain, each individual exchange will have to manage a Client node in order to write KLX transactions in the MainChain channels.

The total number of channels and PrivaChains referenced in the KNS (Kalima Name Service) is limited to 99.900

The maximum number of exchanges will be initially set to 100. Each Exchange will have a maximum number of 1.000.000 addresses.

Theses limits are fixed to protect KLX platform against deny of services attacks.

Validation nodes on cloud platforms

Validators can run a voting and non-voting machine on a cloud computing platform or on premise. Client nodes can take advantage of small memory footprint of Kalima and its capacity to run in small devices, IoT gateways or smaller.

Also note that egress internet traffic usage may turn out to be high.

- **Docker**

Running validator for live clusters (including mainnet-beta) inside Docker is not recommended. This is due to concerns of general Docker's containerization overhead and resultant performance degradation unless specially configured.

- **Software**

Prebuilt validators binaries are available for x86_64 CPUs
(Ubuntu 20.04 recommended).

- **Networking**

Internet service for validators should be at least 300Mbit/s symmetric, commercial. 1GBit/s preferred

HOW TO BECOME A KLX VALIDATOR ?

Any KLX holder can aim to participate in the consensus as long as they hold a KLX reserve to receive the associated compensation. Only the validators chosen by the network itself will become validators for the Kalima MainChain. This election guarantees a sufficient level of rewards for the elected validators. Each alidator elected will be subject to a security Bounty to ensure that it has a sufficient level of security for its infrastructure.

Any validator harming the security of Kalima will be blacklisted and will not be allowed to apply for a minimum of 3 months.

Hardware recommandation

6 core or more. Optimal : 12 threads, 2.8GHz,

AVX2 instruction support is useful, not mandatory

AVX512f and/or SHA-NI instruction support is useful, not required

GPU: not required

RAM: 16 GB, or more

Disk: SSD NVME, or better, 200 GB, or more.

KALIMA NAME SERVICE (KNS)

The KNS allows the identification of channels and PrivaChains inside the Kalima blockchain network.

These blockchain names are easier to manage for users than the corresponding IP addresses similarly to Web domain names.

In the same way, inside a PrivaChain the addresses have a correspondence in the form of a URL allowing, if necessary, to better identify the addresses.

- **Similar to DNS or ENS**

Initially you had to use IP addresses on the Web, nowadays, you can use alphanumeric values in the crypto and Web3 space. Since the beginning, Kalima has been proposing a URL type naming associated to classical addresses.

- **KNS and PrivaChains**

When you create a PrivaChain you have a domain associated to it
You can easily create and own its subdomains to name your enterprise, establishments, services, machines, buildings, connected objects etc..

- **KNS and Channels**

In the same way, each Channel has its own domain which simplifies the global view of the mainchain

RoadMap & Team

TOGETHER TO AN INTERNATIONAL ADOPTION

The Kalima Team has a strong experience in IoT and Blockchain

2024
Kalima Network Launch
Bridge ERC20 to
native KLX token
KLX Wallet

2022
Q3-Q4
ICO - Private Sale
Security Bounty
Blockchain Certification
Data Safe

2023
Q1-Q2
Bitmart Listing
Listing on DEXs
Kalima Test Net Live
Validation Pools Offering
Rust SDK
KLX Staking

2023
Q3-Q4
Go SDK Launch
Kalima Polygon - Bridge

2022
Q2
Kalima Client side
Smart Contract for
Lightning Network and
Bitcoin (Layer 2 and 3)

Kalima – Kerlink :
Embedding Kalima
Blockchain in Kerlink's
Gateway

ICO - Seed Phase

2022
Q1
C SDK
Data Lake

Kalima Client side
Smart contract for
Tezos

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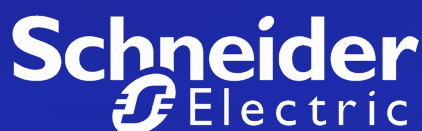Financial & ICO Advisor

Xavier Laurens
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Kalima Partners & Users

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