


# Klever Blockchain Whitepaper

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# Introduction

## Blockchain is difficult, but it shouldn't be.

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## The past decade’s remarkable growth of Bitcoin to establish itself as a globally recognized force in the world of finance has fundamentally changed the way we view ownership, freedom and the individual’s right to public financial tools.

With Bitcoin's simplicity, universal accessibility, audibility, and properties of non-censorship, the BTC network is an ideal base layer to power the emerging crypto economy.

At Klever, we view the entire crypto economy as a blossoming tree. The roots consist of two different decades-old technologies; cryptography and distributed computing. The merger of these technologies by Satoshi Nakamoto led to the creation of Bitcoin, the world’s first blockchain.

## The trunk and beating heart of the tree of the crypto economy is undisputedly Bitcoin.

Meanwhile, the branches are layer 1 blockchains supporting smart contracts such as Ethereum, Solana, Tron, Binance Smart Chain (BSC), and other protocols powering decentralized applications (dapps).

The leaves, fruits and eventual flowers growing on top of the branches are the dapps, products, and services built on top of the smart contract platforms.

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**Smart contracts are great, however they are not only difficult to code and expensive to execute. Even with expert programmers writing the code, smart contracts today often suffer from innumerable security vulnerabilities, resulting in exploits and hacks that total billions of dollars over the past years alone.**




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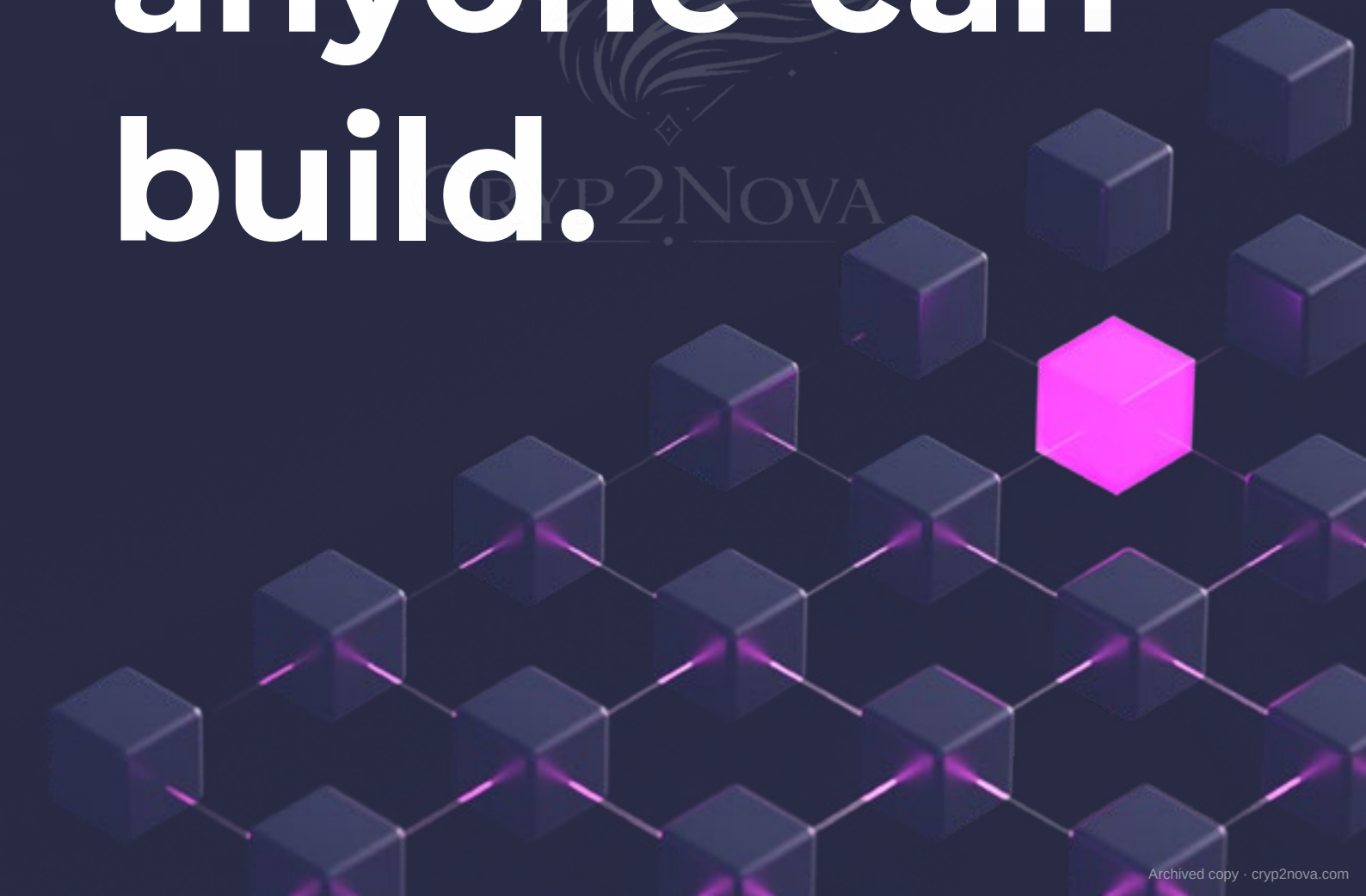
Since Klever launched its first wallet in 2017, cryptocurrency has evolved tremendously thanks to a growing number of industry players, more users around the world, mainstream adoption, and a variety of products and services.

Nowadays, launching your crypto project and integrating the most useful and essential features desired is very challenging, since developing popular blockchain integrated dapps requires specialized and still rare development skills. Furthermore, blockchain building becomes increasingly complicated and expensive every day.

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We as an industry must instead provide the most straightforward, simple, cost-effective, and time-saving tools so that developers can integrate crypto services and build blockchain applications in no time.

# On KleverChain, anyone can build.



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# Who is Klever?

After working more than 10 years for big enterprise companies as consultants, we were not happy with the work environment we saw there. Our goal was to work remotely, without time sheets, without office politics and without many meetings that result in poor decision-making.

**We had to try to change our game. Though our first two ventures failed, we gained invaluable experience on how not to do things, and in 2013 we founded a consulting company called Getty/IO.**

**Getty/IO was one of the world's first 100% remote companies specialized in software architecture, performance and engineering.**

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"It all began in my small, rented apartment in Rio de Janeiro, it was 2013 and only with 2 small wooden tables, 8 low profile notebooks, 8 uncomfortable chairs, and 8 dreamers. We had no money, but we had a dream to build a company that we envisioned could impact the world for the better and one that we would all love to work at."

— Dio Ianakiara, Co-Founder & CEO of Klever.

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It was not a sea of roses. In our first two years, Getty/IO was barely surviving. We had no money for an office. We had no money for hiring and after many conflicts regarding the lack of budget, some of our friends left the company before it even launched.

We decided to bring on two interns and go fully remote in 2013. Marlon Gomes and Vitor Pereira had no previous experience but had a burning desire to learn from my brother David, myself and Bruno Campos, who today serves as Klever CTO. Today, Marlon is Klever's Head of Software Architecture at age 27, and Vitor our Product Manager at the age of 27, and both are co-founders of Klever.

Working with many projects we met Fabio Freire, João Pedro Cruz Lima (JP), and Marcio Lima. They were the only ones that believed in our company, and without them, we would never be here today.

JP has brought many new clients, strategies, and prospects to our company, and in 2016, we had more money than debts in our bank account for the very first time.

Between 2013 and 2018, Getty/IO delivered more than 100 projects before making the Klever Wallet a reality.

Today, JP is Klever's Head of Business Development and Strategy, while Marcio our CFO and Fabio our Head of Design and User Experience.

The problem is that Getty/IO was the kind of business that only scales with more people, and we knew that. Since the inception of Getty/IO our goal was to build a product and pay for its investment with the revenue from our consulting firm.

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After many brainstorming sessions, we knew that the future of the financial system would have to be more open and accessible. Decentralized self-banking was already being widely discussed and the rapid growth of p2p technologies was only accelerating, huge amounts of capital was flowing into crypto and the building of public financial systems, which made us visualize the crypto wallet of the future.

The problem was that the technology to create the crypto wallet we envisioned did not exist yet, so we had to build everything from scratch in order to meet our own security standards.

Somehow destiny comes into play.
It was January 2019 when Dio met Fernando Sobreira and Misha Lederman in San Francisco.

"We went to the same event for the reasons of our destiny, and there we developed a great synergy and friendship. Misha Lederman is a communication genius, and ready to be our voice to the world and fight for our team and community. Sobreira is a blockchain guru that can build complex and high-level projects and has unlimited potential to create advanced technology in a remarkable time frame. Today, Sobreira is Klever's Director of Blockchain Research and Development, and Misha is Director of Communications at Klever."

What started as a sea of endless troubles has become one of the biggest and most exciting challenge for us:

To create a fair, easy, and safe crypto ecosystem for everyone, an ecosystem that would meet our needs and we could trust.

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Besides a strong presence in the US and Europe, our most significant markets include countries like India, Nigeria, Ghana, the Philippines, and Indonesia. Meanwhile, many other developing nations' populace are tapping into the power of Klever to go from being unbanked to becoming self-banked. For the first time in their lives, unbanked people can actually own their money. They can independently decide what to do with their finances.

This is a freedom we do not take for granted and we work tirelessly to ensure that financial tools become available to anyone in the world through our products.

Through trial and error, and never giving up on our vision, Klever has grown from a software consultancy firm building products for other companies to a global crypto powerhouse with millions of users in our wallet ecosystem. Now we are set to launch our very own layer 1 blockchain and start a whole new story.

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# Come and join us, it's just the beginning.

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# 01 Klever Blockchain

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## Klever Finance has dedicated the past years to building blockchain solutions and crypto products for millions of users around the world.

**100+**
**Blockchain Nodes**

**20+**
**Blockchain Protocols**

Over the years, Klever has built products and services on the world's top blockchain networks and currently runs 100+ blockchain nodes on top of 20+ major blockchain protocols to ensure optimal uptime for our global users' every crypto need.

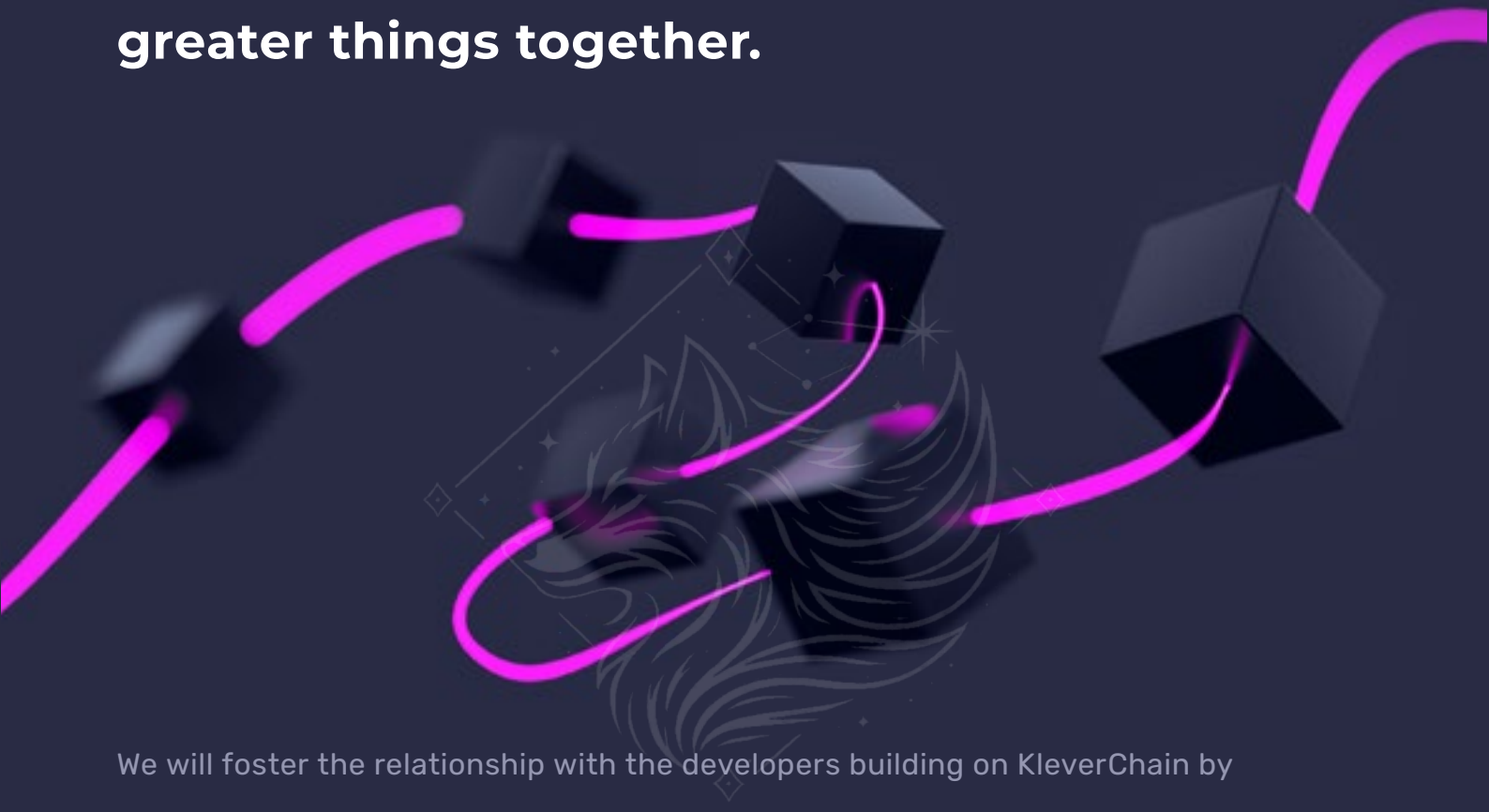
We have thus acquired vast expertise in blockchain technology, cryptography, immutability, and which technologies are most effective in facilitating high performance, speed, security, and reliability.

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## Simultaneously, we have experienced a repeated absence of ample, accurate and updated documentation released by blockchain protocols for integrations, as well as a recurrent lack of communication and cooperation from the blockchain foundations' technical teams.

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# KleverChain is here to change and vastly improve the dynamic and essential relationship required between developers and blockchain foundations in order to achieve greater things together.



We will foster the relationship with the developers building on KleverChain by understanding their needs and addressing them while providing a safer, faster and smarter blockchain building experience through a permissionless and community governed blockchain protocol available to all developers and users globally.

The use cases of KleverChain are both powerful and numerous, but all are based on usability. The notion of usability is directly reflected in the features Klever Blockchain has to offer since they are rooted in the Klever team's own experience in building products on top of the world's leading blockchain networks. Having this experience has made Klever focus on making blockchain building easier, simpler, faster, and smarter, but more importantly making it usable and enjoyable for developers and users alike.

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# At Klever, we aim to create a network based on security, efficiency, and innovation that empowers businesses and individuals to participate in the global decentralized economy in a trustless and accessible manner:



By empowering people with equal economic opportunity, we want to accelerate the adoption of decentralized finance.

By utilizing peer-to-peer and blockchain technologies, we strive to create the most innovative, secure, and easy-to-use products possible.

By leveraging the power of blockchain technology, Klever empowers people to find innovative solutions for real-world problems.

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With KleverChain, developers can build decentralized applications in a way that has not been possible before. The Klever Blockchain makes it easy, cheap and enjoyable for developers to build and deploy blockchain apps and integrate all essential crypto features into their projects, without even needing blockchain coding experience.

KleverChain enables this by offering an array of ready-built and native decentralized applications, which have been prodded, tested, optimized and advanced through a half-year long testnet period, plus one year of internal devnet testing in order to make your blockchain experience as secure, seamless, simple and inspiring as technologically possible.

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# Financial Tools as a public service




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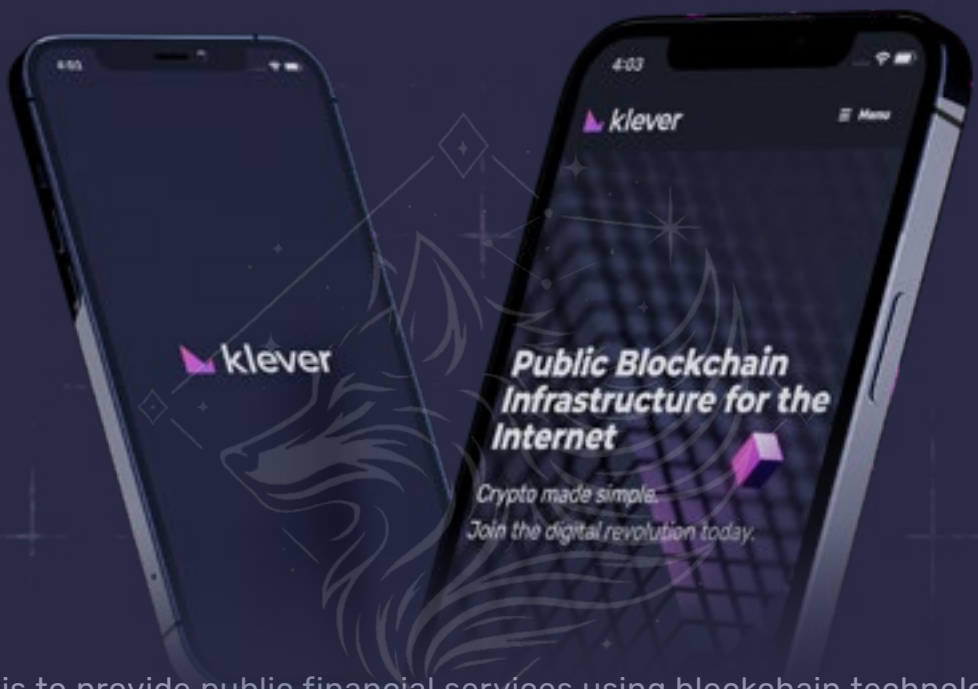
## At Klever, we believe that everyone has the human right to access essential financial tools.

Today, most of the world's population is provided public services for essentials such as water, gas and electricity. Both public entities and private companies provide these public services to billions around the globe.

In contrast, there is a blatant lack of public financial services that are accessible to everyone, regardless of their origins, social status, gender, or nationality.

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**Therefore, Klever Finance's overarching goal is to build out the infrastructure for a world where everyone can receive financial tools as a public service. KleverChain will function as the foundation to empower this ambition.**




Our mission is to provide public financial services using blockchain technology to all people worldwide in a safe, trustless way, using mobile and web applications. This is becoming an alarming necessity, as up until the dawn of blockchain people of all swaths of life needed to rely on private banks to manage their finances, and yet the number of unbanked individuals is at an all-time high and continues to rise.

**Klever strives to address this issue by providing everyone, both unbanked and banked individuals, an alternative to private banks and instead builds out an infrastructure for public financial services that is available to everyone.**

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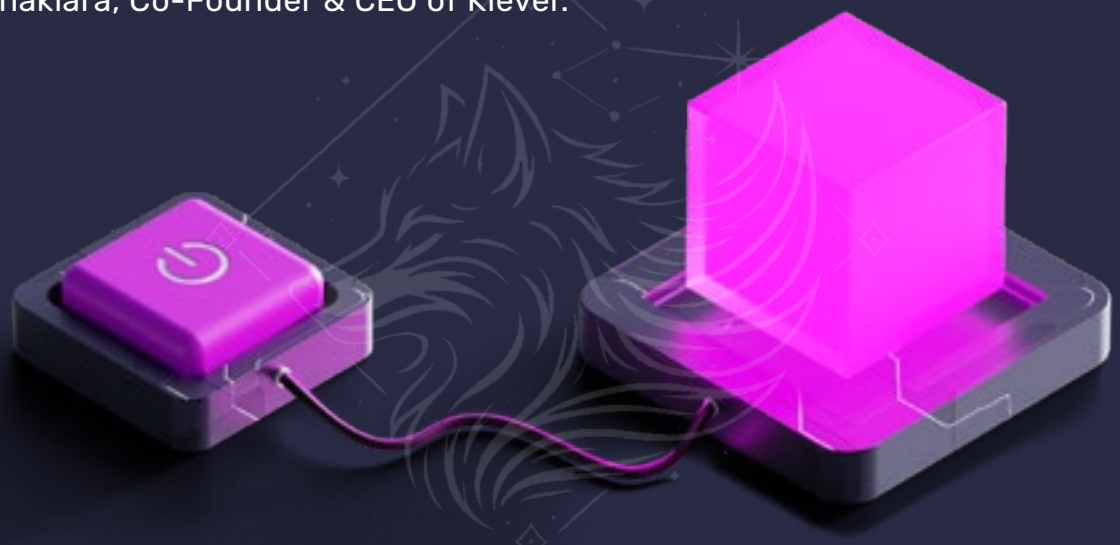
# Why build our own Blockchain?

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Klever has been working with many top blockchain foundations over the years, and it is an exceedingly hard and long process to fully understand how a specific blockchain works and functions.

**“I don’t think developers need to understand how a blockchain works - they just have to call a well documented function in order to use the blockchain.”**

— Dio Ianakiara, Co-Founder & CEO of Klever.



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In order to build a more efficient and scalable blockchain upon which developers and the community of users can thrive through simple and accessible features, Klever is reinventing what blockchain building is all about.

**SmartContracts are great. But, by removing its complexities as we know them today, and replacing it with native coded features into the blockchain we create what we call SmartContracts 2.0, or Klever Contracts.**

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# With SmartContracts 2.0 engineers can significantly reduce development time, increase security by using native blockchain features. It allows you to focus on building the projects of your dreams, at a fraction of the cost.

It has always been our dream to build out the technology to support and power our own applications and line of user-centric Klever products:

- **Klever Wallet**
- **Klever Swap**
- **Klever Exchange**
- **Klever Safe**
- **Klever Kustody**
- **Klever Web Extension**

while maintaining a fee structure that is controlled by the community and not decided by any third party organization.

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# KleverChain - Connecting the Klever Ecosystem




High fees and sudden unpredictable increases in fees on other blockchains are other prominent reasons why we need a blockchain of our own to power the ever growing Klever Ecosystem. As developers, builders and users, we simply cannot rely on a protocol that arbitrarily changes its fees, on already unacceptably high fees. Moreover, as the crypto industry grows and more users flock to blockchain-based protocols, these fees will simply continue to increase.

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**“We were limited by third party technologies to build our own products, services and applications. Limited by high fees, the lack of communication from blockchain foundations and limited by major exchanges who were reluctant to list our utility token KLV. Klever Chain will remove all those limitations.”**

— Dio Ianakiara, Co-Founder & CEO of Klever.

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Launching our own blockchain is a game changer for the Klever Ecosystem. At the same time, having a blockchain foundation that works in close tandem with the developers who build the apps and products on top of KleverChain to support their development is a game changer for the entire crypto industry. No other blockchain foundation has closely supported developers before, and it is usually difficult to start without this essential support.

**With Klever Chain, we can explore new ideas, not be afraid to make mistakes along the way, and learn from those mistakes as we all grow together.**

**“Sometimes we make mistakes, but mistakes are the steps to our success.”**

— Dio Ianakiara, Co-Founder & CEO of Klever.

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Klever Finance is aiming to tie together the benefits of blockchain technology with real business enterprises by working closer to the project's building on top of KleverChain than we have ever experienced on any other blockchain. Their success is our success.

We are aiming to make blockchain development as easy as development in the legacy web2 space, thereby opening the doors for millions of highly skilled web2 developers into the world of web3, so they can leverage their experience without needing to attain deep new knowledge of blockchain development.

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# 02 Klever Apps Kapps

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# Klever Apps (Kapps) are on-chain applications developed by Klever Finance together with and for the Klever developers community.




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KleverChain will offer pre-built and ready-to-use apps and functionalities native to the blockchain, not merely a smart contracts platform.

In a smart contract blockchain platform, developers need to code a smart contract for all their blockchain applications and features, including something as simple as creating a token. This means that as a builder of dapps without smart contract experience, you have to rely on and trust the person or team that has developed the smart contract itself and simply hope that there is nothing vulnerable or malicious hidden in the smart contract.

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**“Klever has a completely different approach and instead builds the Klever Blockchain with smart contracts coded into the blockchain itself. It is inspired by what Satoshi Nakamoto did with Bitcoin: code once and the Klever contract or Kapp will be there forever for anyone to use.”**

— Dio Ianakiara, Co-Founder & CEO of Klever.

This means that it will be easy to compile and pre-execute tests for developers, and thereby ensure a higher level of security for the application.




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Unlike other blockchain protocols and blockchain foundations, Klever Finance will work directly with developers and projects - providing the full blockchain integration for them and building the functionalities that they want and need in the protocol.

We do not intend to offer developers the ability to build these foundational applications inside of the Klever Blockchain, but rather to build the protocol and its accompanying features for them.

**That way all builders can focus on what is most essential to their specific projects: their own products, their own services, their own business model and their own project's development.**



This approach of utilizing ready-built Kapps for all developers to use results in blockchain applications that are safer by design since they are native into the blockchain as well as easy to use for the developers - the process will just be a function call, not a complex and often vulnerable smart contract.

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## In other words, Klever facilitates direct blockchain integration for all developers by eliminating the complexity and vulnerability of smart contracts, replacing them with ready-built apps and native features of Klever Blockchain.

This means that it will be easy to compile and pre-execute tests for developers, and thereby ensure a higher level of security for the application.

By removing smart contracts as we know them today and the virtual machines (VMs) prevalent on other blockchain protocols, KleverChain gains high performance with near-instant finality when executing code because all functionalities are previewed and predetermined by the code itself, which is native to the blockchain.

Developers will be able to implement their own interface solution through the easy-to-use, intuitive and versatile KleverOS Software Development Kit (SDK). Using the innovation of the KleverOS SDK, the functionalities of the Kapps deployed to KleverChain will constantly be evolving, and Klever Finance will be deploying new versions with improvements to the Kapps that does not block or inhibit the use of previous versions.

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# Developer Tools

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# KleverOS SDK

**By utilizing this groundbreaking approach to blockchain building, KleverChain's native infrastructure is vastly more secure, simpler to build upon, and cheaper to deploy for dapps than on any other smart contract blockchain network.**




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Due to KleverOS SDK's simple design, mobile and web developers do not require a deep understanding of crypto and blockchain. With such low code integration previously unheard of in the blockchain space, developers and builders will be able to offer decentralized financial products and services with extreme ease.

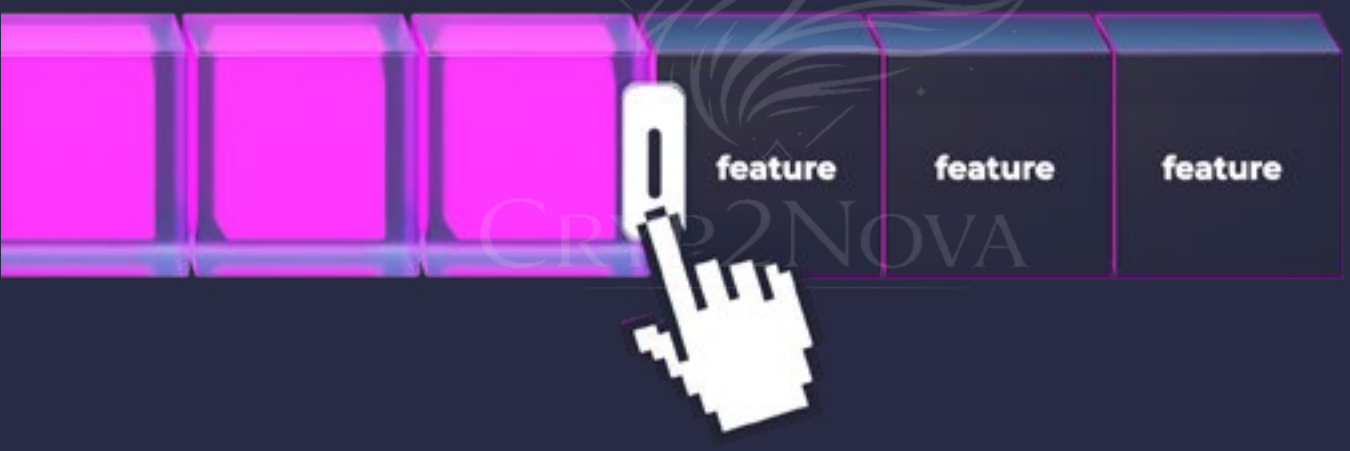
**Apps can often be difficult to deploy on blockchain networks due to their complexity and difficulty, but this should not be the case. KleverChain is here to change that fact.**

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By lowering the barrier to entry and making it easier to deploy the features you want, we invite a much broader community of developers, visionaries, businesses and users worldwide.

In addition to working with independent developers and traditional industries alike to understand their needs, Klever Finance will develop and deploy the Kapps needed for legacy companies to make use of blockchain technology.

In parallel, we will continue to expand KleverChain functionality and features, as we expand the use cases of KleverChain applications. We will do this with the backing of Klever's multidisciplinary blockchain engineers with many years of experience.



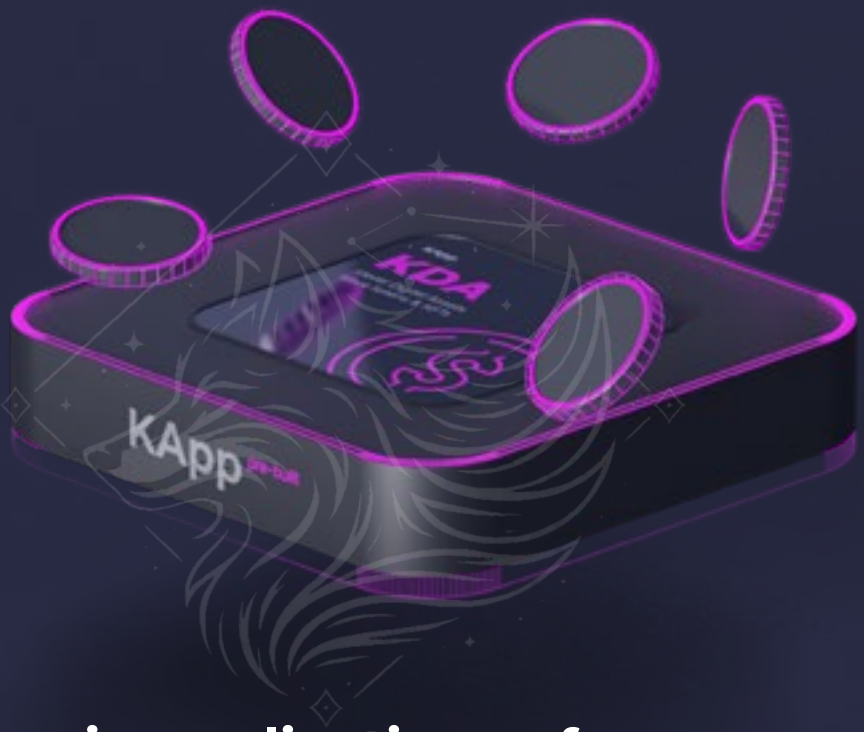

**“Klever will focus on the blockchain layer, which is our expertise and specialty, and developers can focus on their application, saving both a significant amount of time and costs for development.”**

— Fernando Sobreira, Klever’s Director of Blockchain Research & Development.

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# Kapp 01:

# Issue tokens & NFTs (Klever Digital Assets - KDA).




**One of the main applications of any blockchain network is to issue tokens and non-fungible tokens (NFTs). This feature is the basis for tokenization of apps, games and other digital assets, and this is what primarily fuels both the crypto economy and web3 through shared ownership.**

KleverChain tokens are called KDA, which stands for Klever Digital Asset. The ability to issue KDAs is the first and most basic Kapp on KleverChain.

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KDA can be used inside Klever Network apps and are extremely fast, reliable and secure. Klever Blockchain offers native token creation and features without the need for complicated smart contracts. Anyone will be able to create a KDA using Klever Wallet or via the Klever Blockchain Explorer web version.

## KleverChain lets users create native tokens without having to deal with complicated smart contracts.

Project creators can create tokens for a variety of purposes, such as:

- **DeFi projects**
- **Stablecoins**
- **Stock derivatives**
- **Notary documents**
- **Game assets**
- **Inventory management**
- **Supply chain**
- **Staking**
- **Rewards**
- **Logistic records**
- **Loyalty programs**
- **Collectibles**
- **NFT**
- **Gift cards**
- **Stored value**
- **Digital ownership**
- **and much more...**

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The standard features of all KDAs include:




## All KDA additionally come with built-in royalty features, allowing creators to set all parameters according to their needs.

Being able to integrate royalties for both fungible tokens and NFTs as a standard feature directly on-chain is unheard of in the blockchain space and KleverChain will be the first blockchain protocol to offer this on-chain.

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The initial four types of royalty features are as follows and royalties are defined by the token creators:

| |
|---|
| **NFTs** |
| **Fungible tokens (royalty percentage defined by creator)** |
| **Market & Transfer Percentage** |
| **Fixed price in KLV (for NFTs the fixed price is always in KLV, but for fungible KDAs fixed royalty fee is in that specific token)** |

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# Kapp 02:
# Staking




**Staking has developed into a major tool for crypto projects worldwide to ensure long-term community support while giving out rewards to its token holders in exchange for supporting and believing in the project.**

Having a staking mechanism also elevates transparency from the projects' side while preventing major sell-off events, often enabling a more stable and reliable price action in spite of unexpected market conditions.

**Staking will be offered as a feature to all tokens created on KleverChain.**

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Instead of needing to build smart contracts for staking, developers will be able to use KleverChain's protocol for their own KDA-based tokens and thus select and control the inflation mechanism for the token.

## When project creators issue KDAs, they will have the option to enable a staking mechanism that makes each holder of that token be able to receive staking rewards.

For instance: should you as a creator want to give 10% APR, the holders who freeze and stake that token will receive rewards on an hourly basis, for as long as they are frozen and staked.

## KLV is used for bandwidth every time a holder of a KDA claims or stakes their token.

Half of the Bandwidth fee in KLV is burned instantly, while the other half goes to KleverChain Consensus Group, including those delegating KLV to elected Validators.

Projects can also apply to have their KDA Staking be native in the Klever Wallet, thereby making the powerful feature of Staking available to all their holders and Klever users through both the mobile Klever Wallet app as well as the Klever Wallet Extension for web.

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# Kapp 03:

# Raise funds for your project




## Raising funds for your project and building out a community is an essential tool for newly created or young projects to propel their development.

Therefore, anyone creating a KDA can launch an Initial Token Offering (ITO) on KleverChain, giving projects and newly minted KDA tokens a simple and ready-built tool to raise funds and expand their community of holders through KleverChain's powerful third Kapp.

KleverChain will provide an easy-to-use and safe ITO protocol, which any token creator can tap into to create an ITO, set the price and request KLV or any other KDA token as payment for that token.

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## The ITO process is entirely on-chain: a token creator deposits an amount of their token for sale that goes to a pool, and then chooses the parameters they desire for their ITO.

This protocol allows the Klever community of users to participate in ITOs emanating from KDA created on KleverChain, while project initiators can attract new holders and investors, thereby ensuring initial funding of their project.

## Creators can also sell packages for NFTs, where any user is eligible to buy the whole package, not part of it. For instance, one cannot buy 9 out of 10 packages of NFTs.

With fungible KDA tokens, the creator can also give a discount to the token by selling packages. For instance, for packages between 1 and 1 million KDA at price x, for packages between 1 million to 10 million at price y, and so on.

By selling packages during their ITO, the creator can create an attractive market to sell their tokens and get their project off the ground through a successful token sale.

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# Kapp 04:
# NFT Marketplace




**Create NFT Marketplace is the fourth Kapp that will be available at the Klever Mainnet launch. Anyone can create their own marketplace - the creator sets the fees and conditions.**

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Creators simply need to design and build their own user interface and frontend for their NFT Marketplace, while Klever provides the blockchain infrastructure and the NFT Marketplace protocol.

Any user can create their own Marketplace, and any user that holds an NFT on KleverChain can list their NFT to be sold on that Marketplace. The seller can choose the price in any KDA: they can set a price or choose an auction with a time limit. For instance, 10 days in time frame - when the time is over, and if the NFT was not yet sold, the user simply needs to withdraw their NFT and relist if they so wish.

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**“The NFT Marketplace is another huge opportunity for the developers since this feature makes it very simple to give direct functionalities to any game or other asset platform. Imagine a game that has thousands of assets, and the developers can transform those assets into NFTs and use the speed of Klever Blockchain to transact and transfer assets between the users. If they simply want to call the API, they can do that directly on-chain in the backend. I’m not aware of any other blockchain protocol that offers these features.”**

— Dio Ianakiara, Co-Founder & CEO of Klever.

KLV is used for every transaction fee - allow us to reiterate - every transaction on Klever Blockchain uses KLV. All fixed royalties for NFTs are also paid and received in KLV.

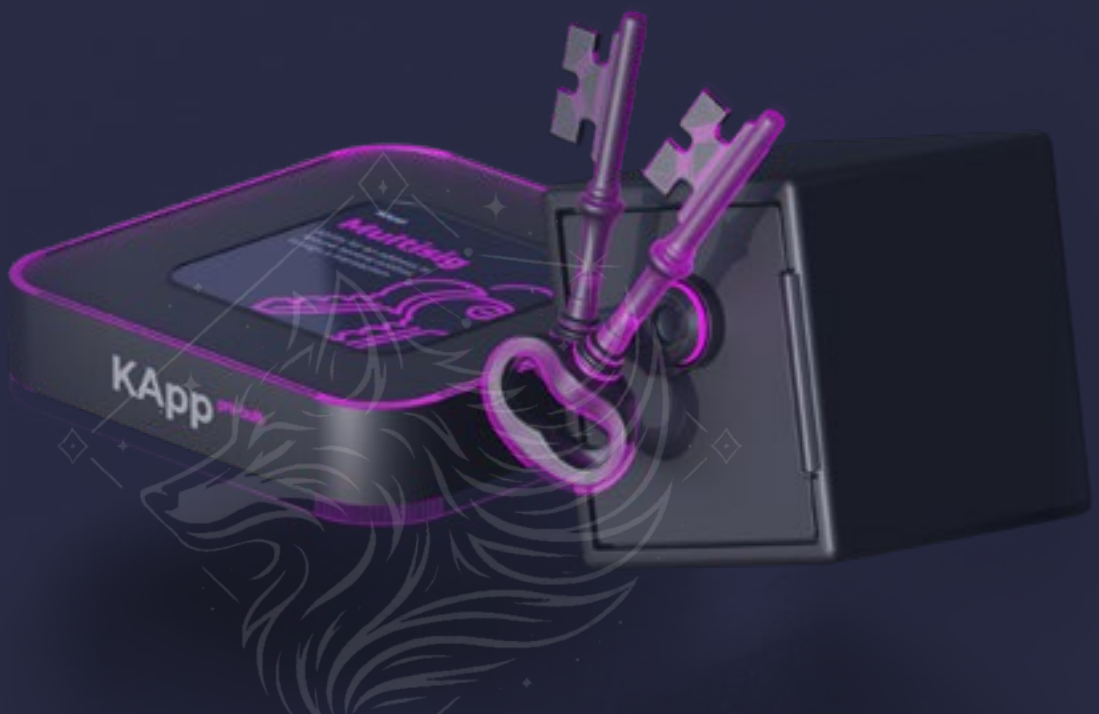
While the transaction fees go to the KleverChain protocol, all fees applied on the NFT Marketplace itself goes to the creator of that marketplace.

Additionally, if an NFT creator has settled a percentage royalty upon NFT creation, any Marketplace executed order will also share the percentage specified with the creator.

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# Kapp 05:

# Multisig - Require Multiple People to Sign




**On Mainnet launch, the fifth Kapp available to all users will be Multisig, which is the ability for an address to require several entities to sign a transaction for that transaction to become valid on the Klever Blockchain.**

Users and project creators can increase their level of security by having multiple people or groups signing the transactions, making Multisig a powerful feature on KleverChain.

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## If any user creates a multi-signature address, they will need to pay a Kapp fee in KLV. Users can create roles for their addresses to delegate responsibility and roles: signature of transaction and specify the actions of what that address can execute on the blockchain.

For instance, creators can delegate a threshold of 3-4 addresses to sign transactions, and each address has a weight (own address has a weight of 4, and others have 1 each, meaning that creator address can sign transactions). Creators can delegate up to 10 addresses using the Multisig Kapp.

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# Kapps Roadmap

- **Liquidity Pool Kapp**
- **On-Chain Swap**
- **Domain Name Server (DNS)**
- **Dice Roll Kapp**




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# Benefits of building on KleverChain

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Benefits of building on KleverChain:

**Decentralized applications can be developed in a simple, fast, and cost-effective manner using Kapps and its ready-to-use functionalities integrated into Klever Blockchain.**

**Dapps can be built directly on the blockchain without requiring intricate or vulnerable smart contracts to be written or used.**

**With an easy-to-use interface and development time reduction, the blockchain comes pre-built with useful features ready to use, saving both time and development cost.**

**Support from a large, growing global community. A community that demands new solutions and applications for the blockchain that will continually evolve.**

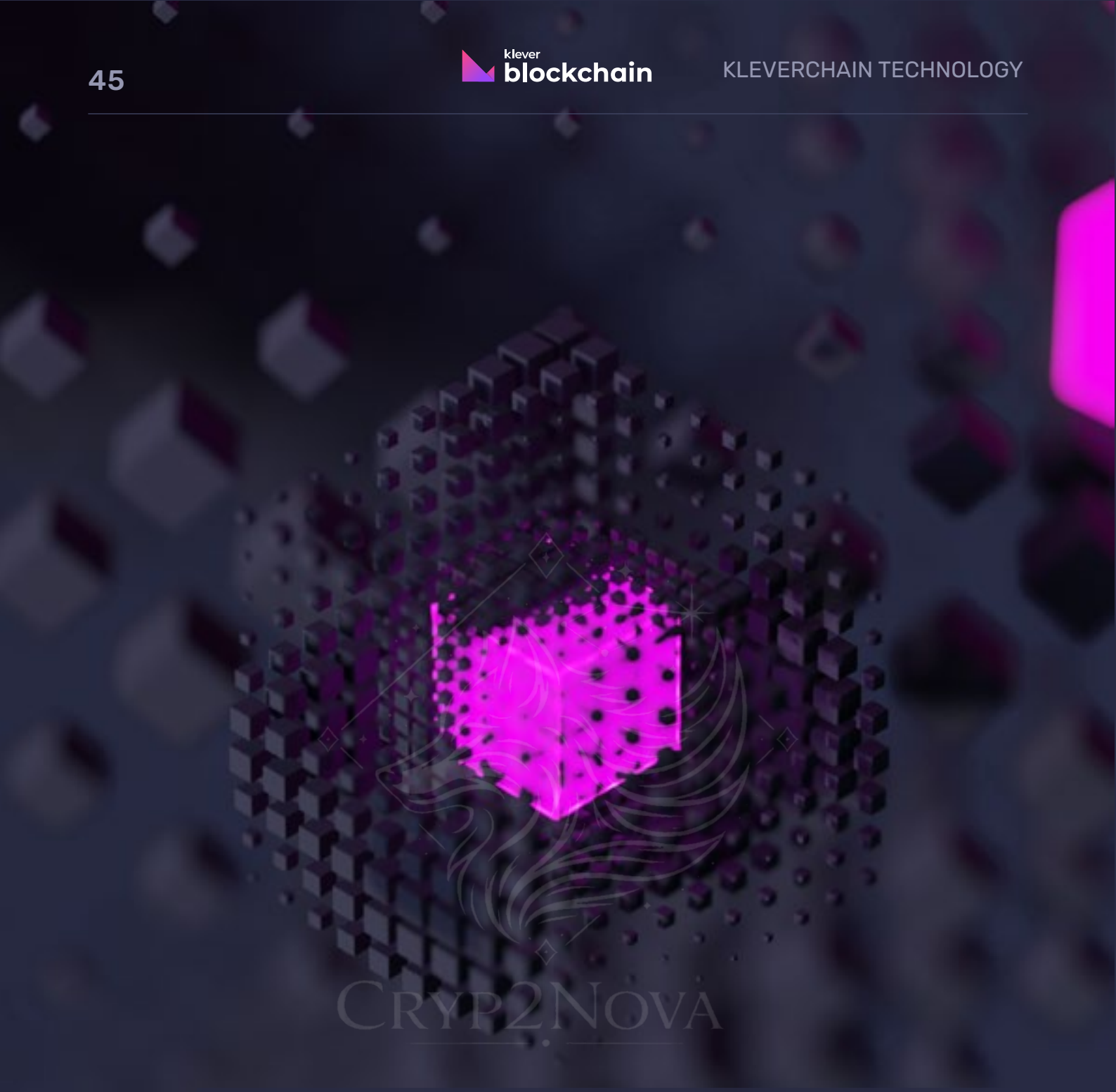
**By adding an additional service charge to your project, you can enhance your profitability, seek new revenue streams and expand your business model.**

**APIs and an SDK ready for use to facilitate the integration and development of new and innovative solutions.**

**Developers are not required to run nodes, and can instead fully focus on their project's development and growth.**

Klever Foundation will provide developers and users a way to submit requests for new Kapps from Klever Finance once the Klever Mainnet is live.

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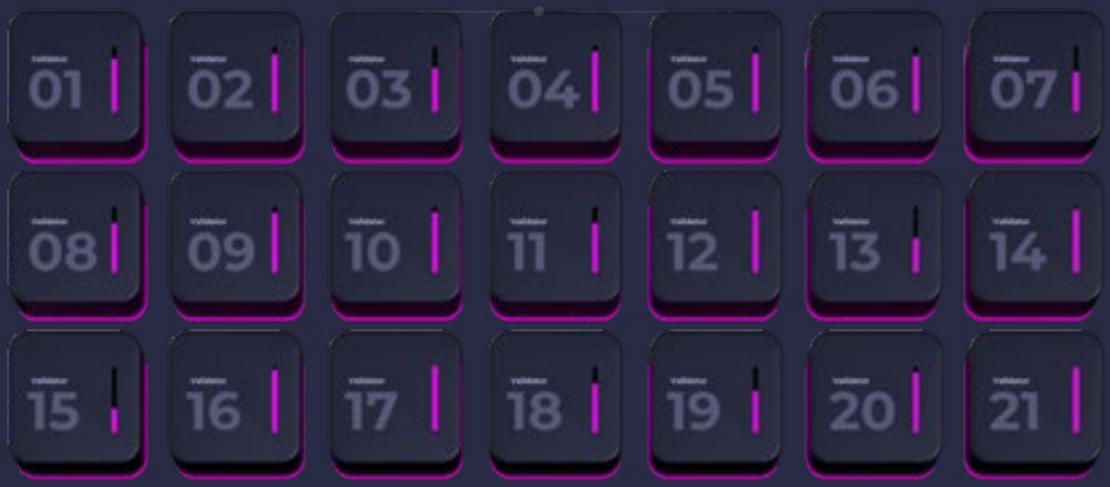
# 03 KleverChain Technology

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**Building and deploying blockchain apps should be simple, cheap, and easy for all developers to do, and that is exactly what Klever Blockchain enables.**

**Instead of being a smart contracts platform, Klever Blockchain provides prebuilt and ready-to-use functionalities for developers to build decentralized applications. This means that developers save both time and money when deploying their apps, products and services on KleverChain compared to any other blockchain network.**

Klever is building a secure and efficient blockchain ensured by a Roll Proof-of-Stake (POS) consensus mechanism composed of 21 validators, which are randomly selected among the Masternodes for the Consensus Group in each Epoch.




In this Technology section, we will go into more detail surrounding the technologies that enable the versatile, efficient and high-performance design of KleverChain.

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# Proof-of-Stake

## The consensus algorithm we use on KleverChain is based on the Proof-of-Stake consensus mechanism.

On Klever Blockchain, POS means that entities, companies or individuals, based on their assets, are selected as validators, and their task is to validate transactions and mine blocks.




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To be promoted as a validator, as well as to operate a Masternode, a user must have a minimum amount of 10 million KLV in total self-staking and delegation. From that total 10 million KLV, the self-stake amount by the validator themself must be at least 1,5 million KLV, while the other 8,5 million KLV can be from delegation from KLV holders.




**Masternodes are essentially full nodes on the network that receive incentives and rewards for taking part in operating the network and jointly recording transactions on the blockchain.**

By using Masternodes, Klever Blockchain users and developers are backed by a highly reliable network and professional services from experienced node operators.

The consensus algorithm selects a portion of eligible Masternodes for every “epoch”, which is a period of time during which the network measures and adjusts its status. Initially, an epoch lasts 6 hours, though this parameter can be changed through proposals submitted and accepted by the KFI governance community.

**This means that a successful proposal to the network by the governance community can update this number of block producers.**

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# Permissionless

## Using a permissionless network infrastructure coupled with an active community governance, KleverChain provides high performance, cost-efficiency and consensus-focused governance cycle.

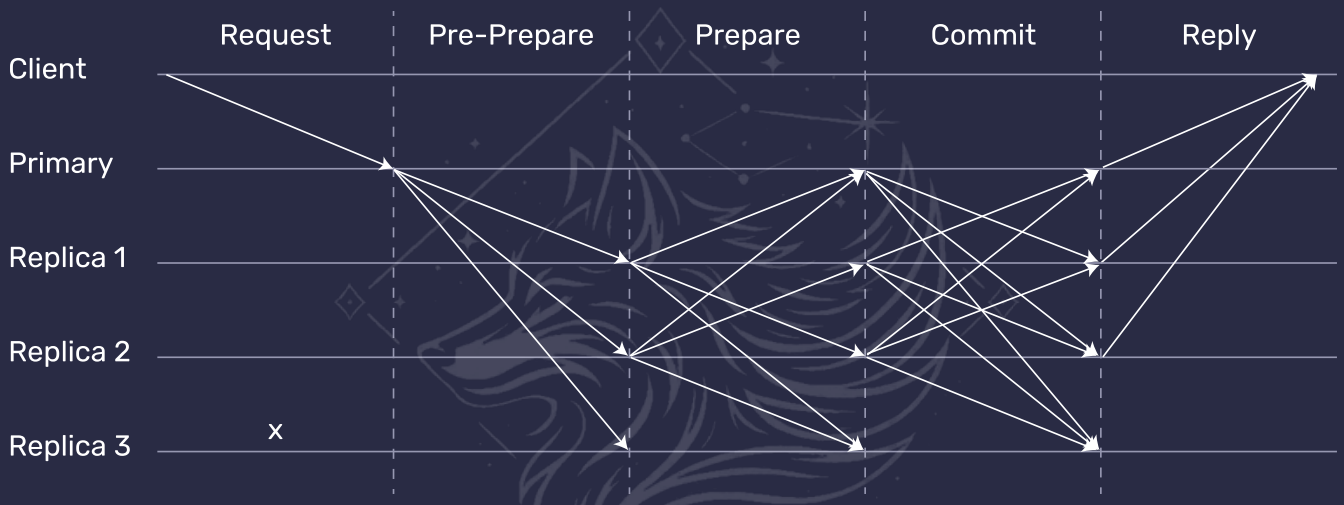
The permissionless nature of KleverChain means that anyone is free to participate in the network as a validator, developer, creator or user, while the community governance ensures that bad actors can be voted out or downrated through proposals submitted and accepted by the community.

KleverChain also runs a control layer on top of the open governance framework in order to ensure ethics, professionalism and competence among the network's validators. This is an essential feature in our mission to protect users against scams, fraud, and unreliable block producers, which are problems that many other existing smart contract blockchain protocols suffer from today.



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# Practical Byzantine Fault Tolerance (PBFT)




KleverChain also runs a customized version of the Practical Byzantine Fault Tolerance (PBFT) algorithm, meaning that before a block is produced on the blockchain, at least 70% of the validators need to agree with the data and information that has been submitted to the blockchain.

The PBFT algorithm on Klever Blockchain consists of a three-phased protocol: Pre-Prepare, Prepare, and Commit. Together, they form the core of Klever's PBFT consensus algorithm.

With KleverChain's usage of the customized PBFT, the blockchain can rely on one block to reach a final agreement on the consensus. By utilizing this approach, KleverChain benefits in terms of speed for the full validation of blocks produced.

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# Masternode

**A Masternode is essentially a full node on the network that receives incentives and rewards to operate and perform actions on the blockchain. As the Masternode status is obtained by KLV staking, a Masternode owner also participates in the KLV staking pool and eligible Masternode candidates can all compete for a spot among the top 21 block producers.**

Nodes will sign-off messages broadcasted to the network building a reliability rank of each operator. Nodes with bad behavior will be jailed. Until this jail time isn't cleared, those ill-behaved nodes will not participate in the validator's selection pool.

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When an epoch starts, initially 21 Masternodes (this number can be changed through consensus around network proposal by the community) are randomly chosen to be the validators for that epoch according to the previous hash. A Masternode can be chosen to be a validator more than 2 times in a row.



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# Scalability and Performance

**The Klever team has learned a lot about the practice of microservices from our experience handling large amounts of data in the private sector and operating dozens of public blockchain nodes while serving over 3 million users on Klever Wallet.**

The scalability of KleverChain is ensured by being built on top of a microservice architecture, where each process is responsible for its own task while being integrated with others. With a one-click solution, anyone who wishes to run their own instance of KleverChain can do so in a fast and scalable manner.

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**With our modular structure, we will be able to increase transaction rates as we attract more users and see a growing demand. Currently, KleverChain can handle 3,000 transactions per second (TPS), although this will increase with the growth of the network and the future deployment of sidechains.**

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# Validators

## Validators function as the operators and security backbone of KleverChain, maintaining the health of the network by validating transactions and data into blocks.

When validators confirm blocks, they earn rewards in KLV. Initial block reward flow back to validators is set at 50% of fees paid by users. Inflation will be controlled, and profitability will be maintained by burning an additional 50% of fees. In other words, half of all transaction fees in KLV goes to the validators, while the other half of the transaction fees in KLV gets instantly burned and leads to reduction in max supply.

Additional to the 50% of the transaction fees and the staking rewards, the Validators Consensus Group will also jointly earn 15 KLV per block produced, with 40% being rewarded for the validator that has produced the block and 60% being divided among the other active validators of the consensus.

Given that Masternode status is obtained through KLV staking, a Masternode owner is also a member of the KLV Staking Pool. Reward privileges may be changed by community vote or proposal approval.

As previously stated, there will initially be 21 masternodes that provide the initial bootstrapping of the mainnet. Foundation nodes will burn all the KLV block fees they produce. After Mainnet is stabilized, Klever Finance will submit a proposal to allow public Masternodes to be created and removed.

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# Slot

A slot is the minimum time delay between each block before an elected Masternode proposes a new block. The initial slot time is 4 seconds, meaning that KleverChain produces a new block every 4 seconds.

# Epoch

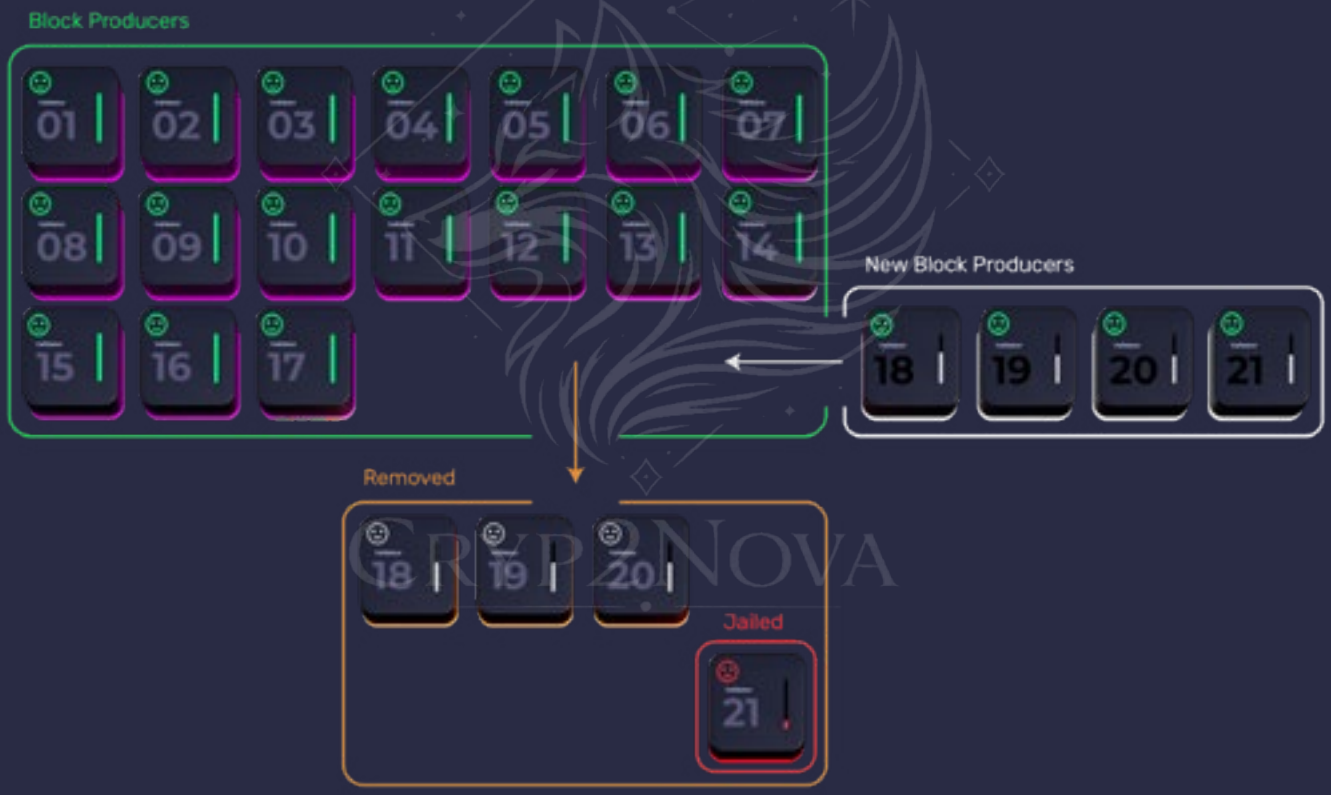
Epochs are sets of slots defined by a fixed time; each epoch lasts 6 hours. This parameter can also be upgraded by network proposal. At the end of each epoch, a new set of masternodes will be selected as the next epoch validators.




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# Block Producers

There are 21 Block Producers per epoch. These 21 producers are selected and at the end of each epoch, the last 4 producers are removed, while 4 new are added at the start. This rotation mechanism ensures that at least 70% of the previous healthy validation remains during each rotation, maximizing network stability. If a producer was performing poorly at the end of the epoch, it will be sent to jail and then a new one will be selected to replace it.




Only actively-producing nodes (with 10M+ KLV) will earn blocks and transaction fees when elected in an epoch. The other Masternodes (with 1,5M to 10M KLV) will participate only in the staking pool.

Masternodes with less than 1,5M KLV in self-staking will remain inactive, meaning they are not eligible to receive delegation from the community.

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# Transaction Fees & Kapp Fee Table

The blockchain fees are regulated by an on-chain voting mechanism governed by the community. For each type of transaction, the fee will be different and subject to change in accordance with the blockchain's governance protocol.

| | |
|---|---|
| **Bandwidth** | 1 KLV (needed for all transactions) |
| **Transfer** | 0.5 KLV |
| **Freeze** | 1 KLV |
| **Unfreeze** | 1 KLV |
| **Delegate** | 1 KLV |
| **Undelegate** | 1 KLV |
| **Withdraw** | 1 KLV |
| **Claim** | 1 KLV |
| **Vote** | 1 KLV |
| **Set ITO Prices** | 1 KLV |
| **Buy** | 1 KLV |
| **Asset Trigger** | 2 KLV |
| **Sell** | 10 KLV |
| **Cancel Market Order** | 50 KLV |
| **Set Account Name** | 100 KLV |
| **Proposal** | 500 KLV |
| **Validator Config** | 1,000 KLV |
| **Config Marketplace** | 1,000 KLV |
| **Update Account Permission** | 1,000 KLV |
| **Unjail** | 10,000 KLV |
| **Create Asset** | 20,000 KLV |
| **Config ITO** | 20,000 KLV |
| **Create Validator** | 50,000 KLV |
| **Create Marketplace** | 50,000 KLV |

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# Fees Explanation

Every transaction on Klever Blockchain has an original Bandwidth fee of 1 KLV + a Kapp fee depending on the contracts the transaction is interacting with.

Half of this bandwidth fee is burned, and the other half goes to the validators pool (for distribution to the delegators), while the Kapp fee goes entirely to the KFI holders pool (for distribution to the KFI holders).

So according to this fee table above, if a user would do a simple transfer of a token, the user will pay 1,5 KLV (1 KLV of bandwidth and 0,5 KLV of the Transfer Kapp Fee). Of those 1,5 KLV,  0,5 KLV will be burned, 0,5 will go to the validators pool and 0.5 will go to the KFI pool for distribution among KFI governance token holders.

If a user creates a KDA, the user will pay a total of 20,001 KLV (1 KLV of bandwidth and 20,000 KLV of the Create Asset Kapp Fee). Of those, 0,5 KLV would be burned, 0,5 would go to the validators pool and 20,000 KLV would go to the KFI pool.



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# 04 Klever Blockchain Roadmap

## 2021

Klever Blockchain

**Testnet Layer 1**

## 2022

Klever Blockchain

**Mainnet Layer 1**

## 2025

KVM

**Klever Virtual Machine**



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# 05 Klever Coin (KLV)

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# Klever Blockchain's main utility token is Klever Coin (KLV).

# KLV is used for all transaction fees, validator staking, validator rewards, delegation, minting and transfers on KleverChain.

We are confident that having KLV as the main utility token for all primary activities on KleverChain in addition to all our existing products, platforms, and services infuses credibility, accountability, flexibility and independence for Klever and its users worldwide.

KLV can be used on KleverChain as follows:

| |
|---|
| **Pay blockchain transaction fees** |
| **Store value** |
| **Make p2p payments** |
| **Pay swap fees** |
| **Reduce swap fees** |
| **Reduce exchange fees** |
| **Pay exchange fees** |
| **Create Klever Digital Assets inside KleverChain** |
| **Create new tokens across supported blockchains** |
| **Provide liquidity for KDA tokens and stablecoins** |
| **Staking with hourly rewards** |
| **Staking for Validators** |
| **Delegate for Validators** |

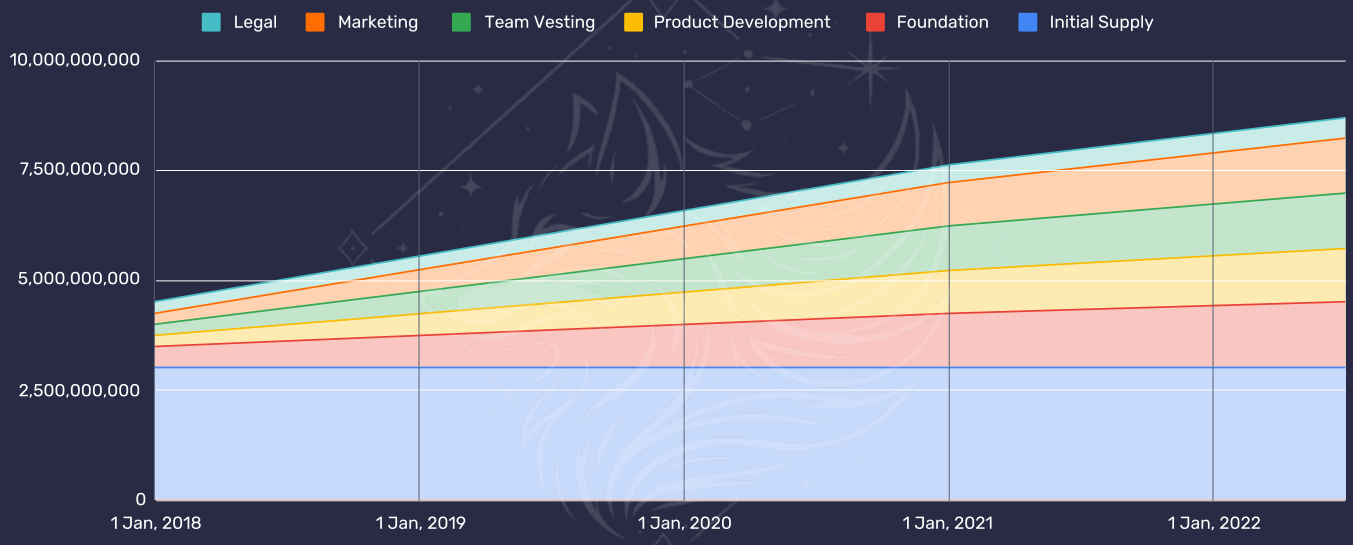
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# KLV Tokenomics

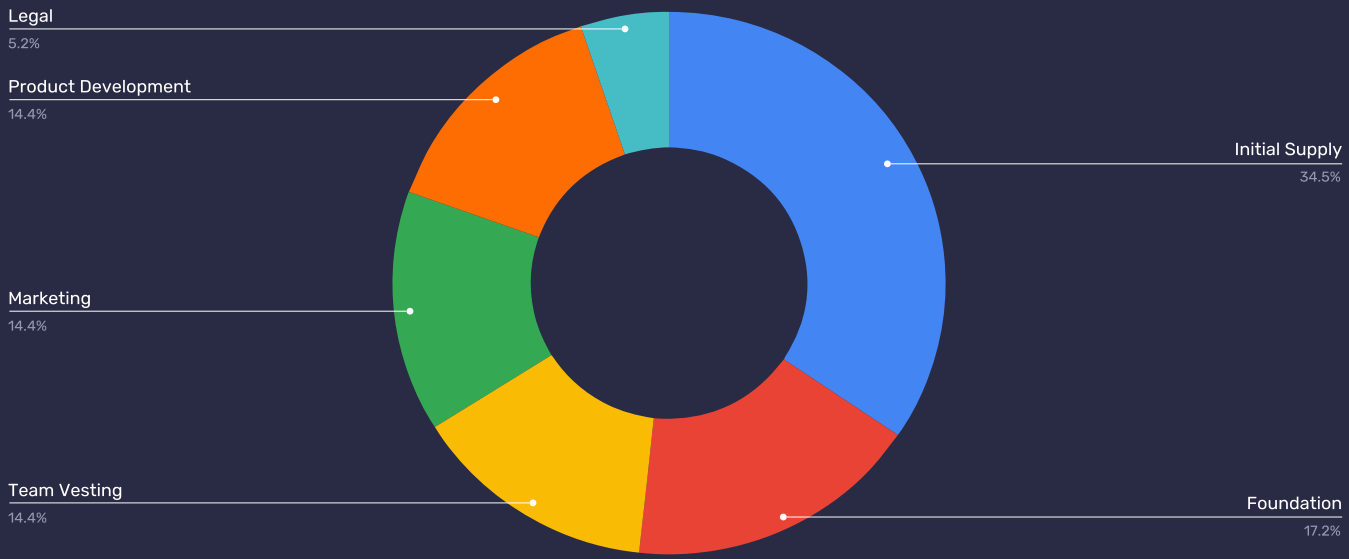
| | |
|---|---|
| **Circulating supply** | ~5,393,319,661 KLV |
| **Max Supply** | 10,000,000,000 KLV |
| **Burnt Supply** | ~1,489,657,057 KLV |

# KLV Release Schedule




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# KLV Token Distribution




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# 06 Klever Finance Token (KFI)

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## On KleverChain, the Klever Finance Token (KFI) represents community governance.

By using an on-chain voting system, KFI token holders can control the app protocol configuration (like application fees and referrals) as well as approve new apps. KFI owners are eligible to receive application rewards in KLV.

As part of the KFI governance community, each application can decide its own fees, and 100% of the fees will be distributed autonomously to all KFI holders, who will need to manually claim the rewards. To receive application rewards, KFI holders must freeze their KFI. As one of the main features, network participants can add KLV as liquidity for all Klever-based Tokens in order to mine KFI tokens.

## To summarize, KLV is the main utility token of KleverChain, while KFI is the blockchain's governance token.

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With KleverChain, we can build an unlimited number of peer-to-peer applications. Every protocol app will have its own rewards contribution model to the network and to the KFI governance community. In parallel to the development of more apps on KleverChain, more value is flowing through KLV into liquidity pools and more rewards are distributed to the KFI governance community.

## In parallel to the development of more apps on KleverChain, more value is flowing through KLV into liquidity pools and more rewards are distributed to the KFI governance community.

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You can use KFI on KleverChain to:

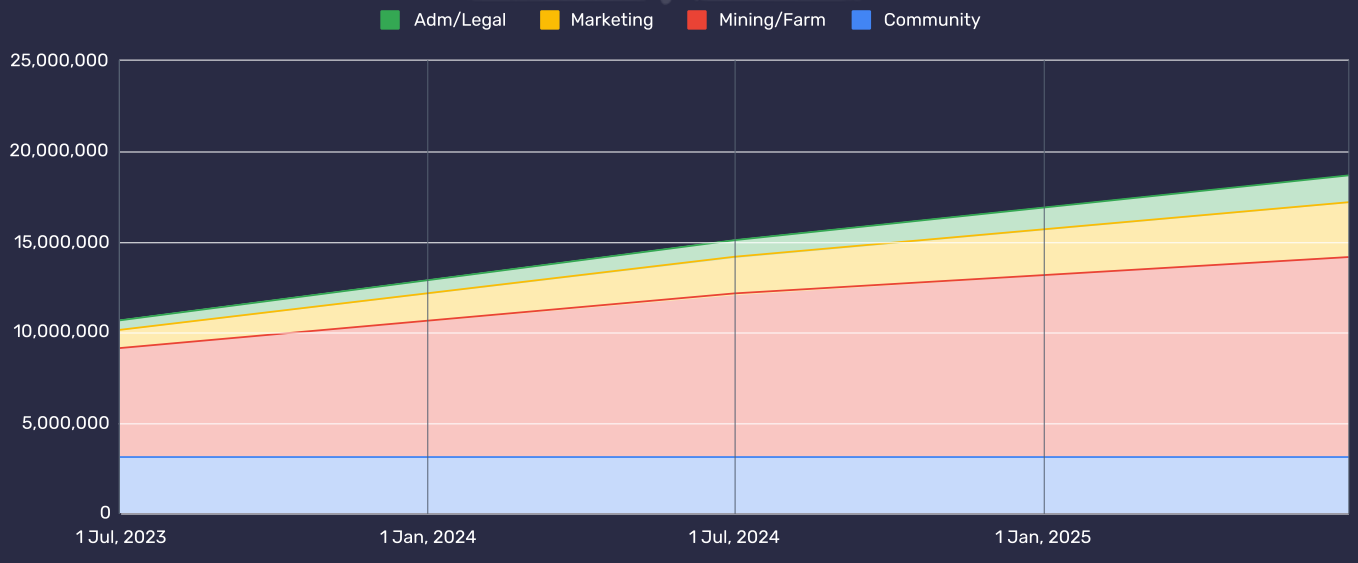
| |
|---|
| **Submit new application proposals** |
| **Vote for new application proposals** |
| **Vote for new projects** |
| **Vote for change of application proposals** |
| **Protocol fee rebate** |
| **Kapps fee rebate** |

## KFI Tokenomics

| | |
|---|---|
| **KFI circulating supply upon Mainnet launch** | 10,650,000 KFI |
| **Max Supply** | 21,000,000 KFI |

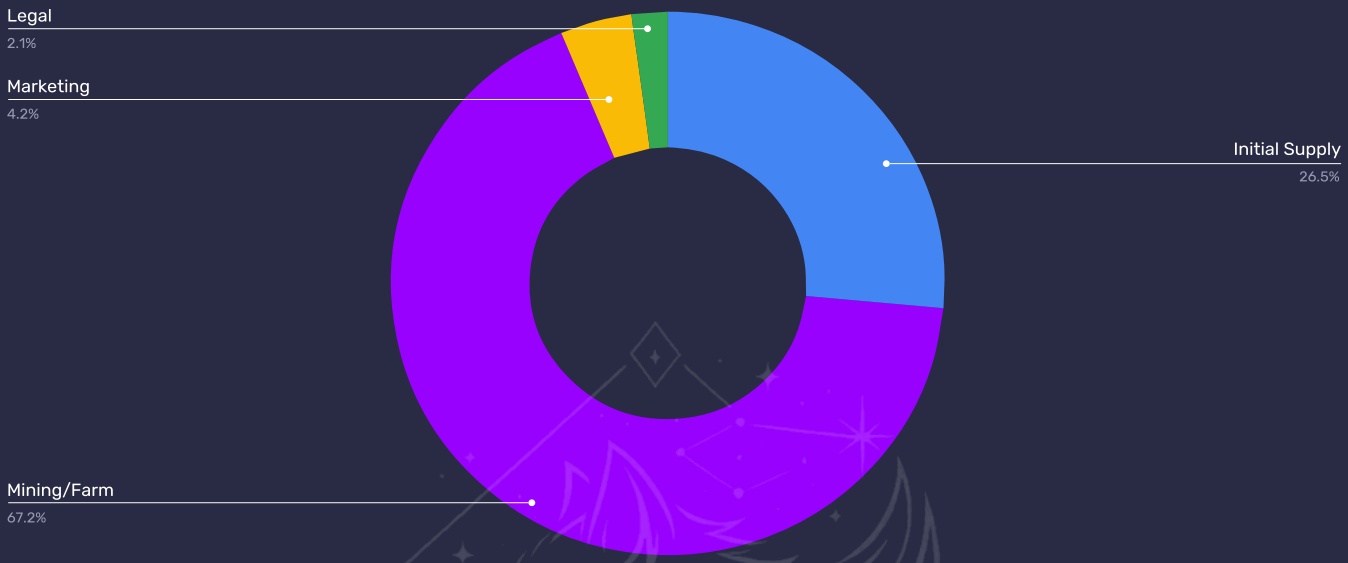
## KFI Release Schedule

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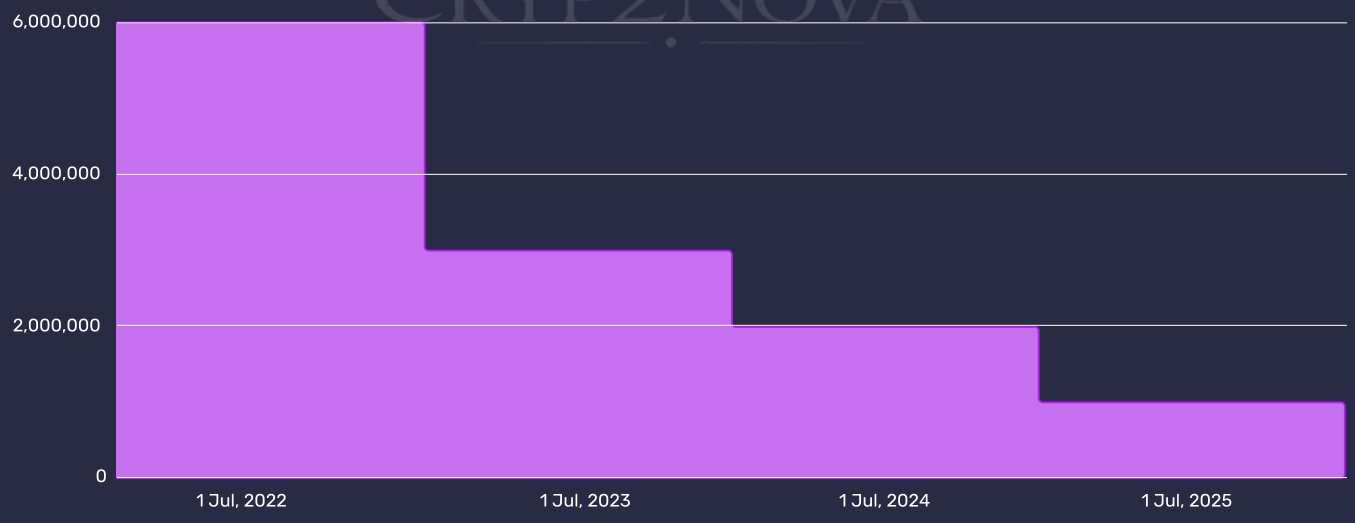



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# KFI Token Distribution




# KFI Farm/Mining Release Schedule




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# Klever DAO

## The Klever decentralized autonomous organization (DAO) is the protocol and system that enables community governance and shared decision making on the Klever Chain.

Decentralization is a process that many times takes years to achieve, and our goal is to decentralize the governance of Klever Chain through the empowerment of the Klever DAO, which is set to be governed by rules encoded on the Klever Blockchain that are transparent and controlled by the organization's members.

Klever DAO allows true community governance through a proposal and voting mechanism for Klever Finance Token (KFI) holders. Through this process, we are giving the users and developers an opportunity to participate in the network in an inclusive and empowering way that was not possible before for the community of users, builders and developers.

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KFI holders can create on-chain proposals to change any and all parameters, such as:

- **Change transaction fees**
- **Change burn rate percentage of KLV per transaction**
- **Change Kapp fees**
- **Change Block rewards**
- **Change Staking rewards**
- **Disable Validators as inactive should they drop blocks or have poor hardware**
- **Change threshold for Validators (for instance self-stake in KLV by validator & delegation minimum in KLV)**
- **Rate a token (prevent a suspected scam project to emerge)**

The timeframe for proposals is set by the KFI holder who creates the proposal, minimum of 1 epoch and maximum of 40 epochs.

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Any KFI holder can vote for that proposal - you vote by using the amount of KFI you have staked. The proposal will pass if more than 50% of all KFI is actively staked and has voted in favor of the proposal.

To enable the Kapp Proposal, at least 1 million KFI has to be staked by the KFI community (this amount may be amended around Mainnet launch). This feature is meant to mitigate against any risk of hostile takeovers.

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# How to protect our network?

**Everyone is free to use Klever Blockchain and participate in Klever DAO.**

**However, in an effort to protect our network, users and network participants, to be considered a verified part of the ecosystem there will be a KYC / KYB process in order to obtain a public and verified account tag in the system for reputational purposes. The process will be done, reviewed and maintained by the Klever Foundation.**



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# 07 Klever Products

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# Klever Wallet

## Klever Wallet, our first and most advanced product with over 3 million users worldwide and already supporting the world's top 20 blockchains, will be the main gateway into the Klever Blockchain.

The Klever Wallet was originally designed to solve two of the most critical problems in cryptocurrency today - crypto security and user experience. Our new and improved version of the KleverChain wallet, K5, will bring both security around blockchain transactions as well as a simple and intuitive user experience to a whole new level.




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Through the gateway and personal home of our users in Klever Wallet, KleverChain will power an already existing and powerful crypto ecosystem, reflecting our vision:

## Crypto made simple.

Klever's team of crypto experts has built and deployed industry-leading products with hundreds of thousands of daily active users (DAUs) throughout the ecosystem.

## The fact that our crypto wallet ecosystem had exceeded 3 million users made it clear that we needed to expand our use cases, but also simplify the use of new features.




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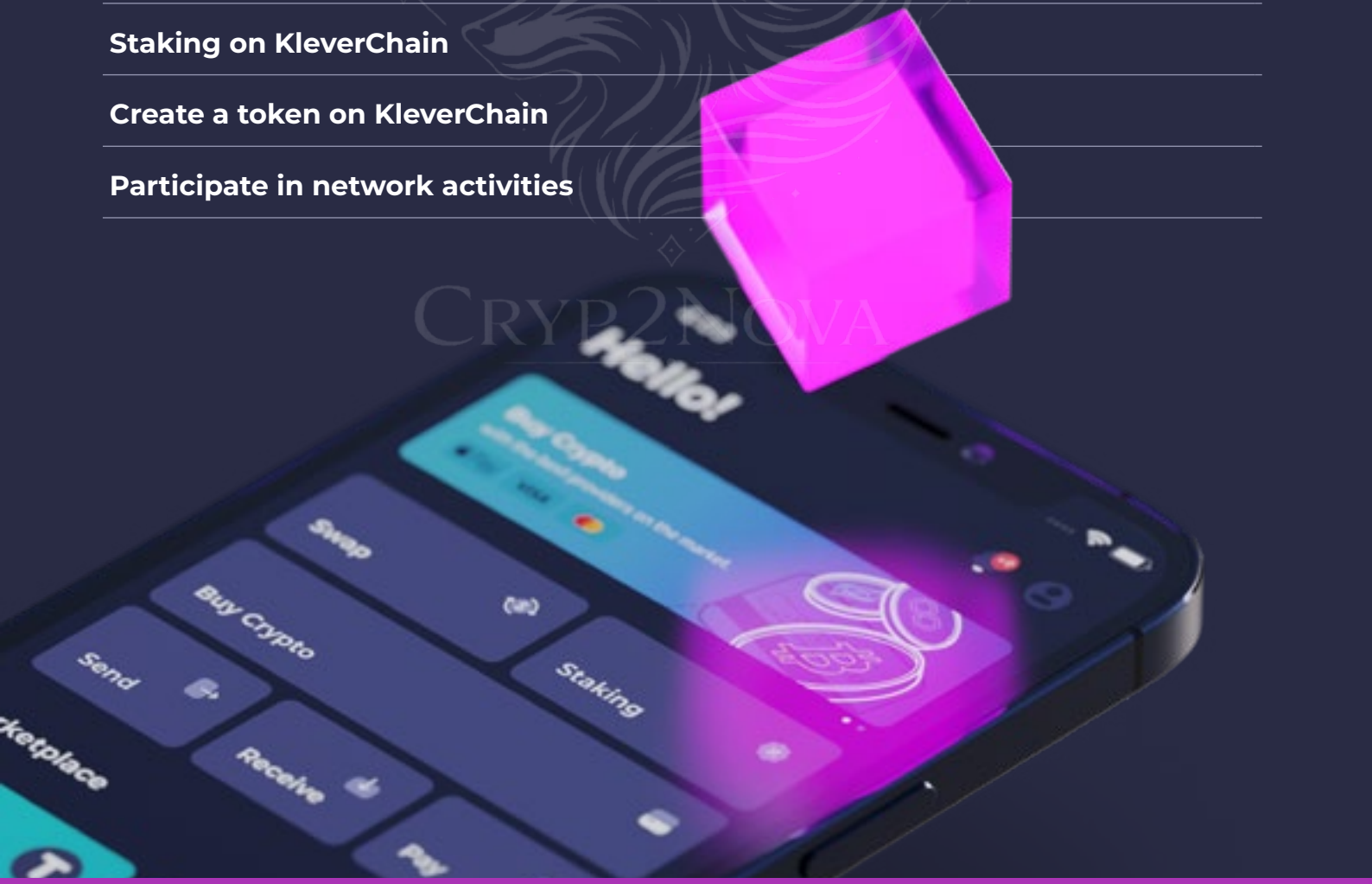
Click to Download Klever Wallet

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The new K5 Wallet is a simple, secure, and versatile self-custody crypto wallet that in the future will support all major blockchains. It includes our infamous Klever Swap offering with 500+ trading pairs, as well as an advanced Klever Browser that offers direct access to dapps compatible with Ethereum, Tron, Binance Smart Chain, Polygon, Kusama blockchains, and more.

## But above all, K5 will come with native integration of KleverChain and all its features, including but not limited to:

- **Send, receive and hold KLV and all KDA tokens**
- **Staking on KleverChain**
- **Create a token on KleverChain**
- **Participate in network activities**




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Get Klever Wallet

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# Klever Safe



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## Klever Safe is the hardware wallet developed by our in-house development entity, Klever Labs.

Klever’s hardware wallet supports all the blockchains, coins and tokens supported by the Klever Wallet App, with the fastest performance and highest security standard available on the market.

Klever Safe brings an additional security layer for keeping crypto assets even safer, with a CC EAL5+ certified hardware solution.

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# KleverChain uses cryptographic algorithms with hardware acceleration support in Klever Safe. Transactions on KleverChain performed by Klever Safe are even faster than any other blockchain.

KleverChain and Klever Safe were designed in tandem, since their preliminary specification. With such a level of interaction between KleverChain, KleverOS, Klever Wallet App and Klever Safe, our users get the best overall performance of any hardware wallet available today.




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Click to get more info on KleverSafe

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# 08 Carbon Neutral

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**Being part in saving the planet as we grow as a community and blockchain ecosystem is an important cornerstone in our reasoning for growth and sustainability.**

**Adhering to a carbon neutral policy is therefore a top priority for Klever, and we are honored to have been awarded an official certificate from Moss Earth in 2020 that we are Carbon Neutral Certified.**




Embracing the Klever philosophy, our team is fully decentralized, functions remotely, and operates worldwide, with collaborators in Brazil, Canada, Israel, Ukraine, Netherlands, South Africa, the United States, and more, we see it as our duty to ensure that we are carbon neutral and part of saving the planet.

**By using Proof-of-Stake, Klever Blockchain will keep to the same values of being carbon neutral and utilizing renewable energy just as Klever Finance the company.**

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# 09 Klever Future

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**KleverChain is certainly the next chapter of the Klever Ecosystem. But more importantly, Klever Blockchain's use of Kapps made available for developers worldwide as simple and essential crypto features to tap into at the click of a button, is in actuality taking blockchain building in the entire crypto space to the next level.**

Making it easier, safer, cheaper and faster to build and deploy a decentralized application on KleverChain, developers will find themselves in an obvious position as they will have more time and funding to prioritize what truly matters to them: their own project and its development.

We are convinced that by working increasingly coordinated and in close cooperation with projects and developers who build on the blockchain, the KleverChain branch of the tree of crypto will grow into its own flourishing ecosystem, with both beautiful leaves of use cases and blossoming flowers supporting public financial services.

Bitcoin and crypto are changing the way we live and move energy in our financial and economic world. The tools to tap into the potential of these incredible exciting p2p technologies, which effectively cuts out the middleman, have to become available to the public on a universal scale, anywhere and everywhere in the world.

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That is KleverChain's mission:

## To build out the global infrastructure for financial tools as a public service.

Financial tools ought to be ready to use from anywhere in the world, independent of who you are and where you come from. Everyone has a human right to financial tools as a public service.

**"One thing that we do at Klever is to solve our own problems first. We have faced thousands of different problems developing the highest quality products in crypto, ranging from security, management and development. Our approach is to solve those problems and through the process evolve as a group and as a team, constantly going to the next level. We will keep evolving our blockchain protocol, developing new features and keep adding value to the Klever Blockchain, to our products and to our global community of users. That is our nature."**

— Dio Ianakiara, Co-Founder & CEO of Klever.

By working hand in hand with the developers building on top of KleverChain, the Klever team will understand the needs of the Klever developers community and build new features and Kapps addressing the issues that they aim to solve.

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There is no limitation to what Kapps, features and functionalities can be built on KleverChain, our only limitation is our own imagination, passion and drive.

Klever Chain was proudly created by the community for the community.

**Launching KleverChain will be a game changer for us at Klever, because finally we will have no limitations to what we can build. Klever Blockchain will truly put our motto to the test:**



# Your only limit is you.

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# Klever Blockchain Whitepaper

v.2.1, December 2024

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