

Kin Protocol - Whitepaper

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Abstract

Emerging markets, particularly in Africa and Latin America, are experiencing a rise in crypto-based micro-lending, driven by new technologies that address financial exclusion by leveraging decentralized finance (DeFi) liquidity pools, innovative platforms like KIN Protocol with NFT-backed undercollateralized loans, and AI-powered decentralized credit scoring to build trust and bypass traditional credit barriers. Despite offering faster, potentially lower-cost financial access, this nascent sector faces challenges such as strict regulatory environments and risks of fraud and volatility. Concurrently, developing economies continue to grapple with significant debt transparency issues, marked by widespread non-disclosure of sovereign debt, "hidden debt" stemming from opaque collateralized resource-backed loans (RBLs) and off-budget state-owned enterprise (SOE) borrowing, and the unreported use of central bank repos and foreign-currency swaps. Both evolving landscapes underscore the urgent need for robust regulatory frameworks, enhanced transparency, and technological innovation to foster sustainable financial development and inclusion.

Introduction

Crypto lending, primarily in the form of micro-loans, is establishing a foothold in Africa and Latin America, offering a new financial avenue for individuals and businesses often excluded from traditional financial systems. This emerging sector utilizes new technologies and methodologies to address financial inclusion challenges, akin to the impact of M-Pesa in Africa.

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Many individuals in these regions are turning to cryptocurrencies as a store of value, often using stablecoins as a hedge against local currency devaluation, and then engaging in decentralized finance (DeFi) liquidity pools to earn interest or obtain loans with their crypto assets as collateral.

However, this growth is accompanied by significant challenges, including strict regulatory restrictions or outright bans on cryptocurrency in many African nations. The sector is also vulnerable to fraud and scandal, and a considerable portion of the underbanked population lacks the understanding to participate effectively. While many crypto loans require volatile crypto assets as collateral, leading to risks of automatic collateral transfer if market values decline, new platforms like KIN Protocol are developing undercollateralized lending models. These innovative approaches leverage on-chain reputation, community vouching, and NFT-backed loan contracts as alternatives to traditional collateral, aiming to provide financial access to underserved populations without relying on centralized credit scoring systems that are often criticized for their inherent biases and inefficiencies.

Tri-Party Ecosystem

KIN Protocol operates on a unique Tri-Party Ecosystem, designed to facilitate decentralized, undercollateralized lending through interconnected roles: Borrowers, Lenders, and Vouchers. This model aims to unlock financial access for underserved individuals and build trust-based lending networks, especially in developing regions where traditional financial systems may exclude many.

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Borrowers initiate the lending process by setting their own loan terms, including the desired amount, Annual Percentage Rate (APR), and repayment schedule. Their primary objective is to secure funding without relying on traditional collateral, instead leveraging their on-chain reputation, community trust, and the backing provided by Vouchers. By attracting Vouchers to stake on their behalf, Borrowers enhance their loan credibility and gain access to capital for various ventures, such as micro-businesses or side hustles. As they consistently repay loans, Borrowers build their reputation, which can lead to better rates and increased opportunities in the future.

Lenders participate by directly funding these loan requests, with the flexibility to choose opportunities based on factors like a borrower's reputation and the level of voucher backing, thus managing their risk exposure. For their contribution, Lenders earn fixed APR returns when loans are successfully repaid. Upon full funding of a loan, an NFT-backed loan contract is minted, detailing all terms and identifying all stakeholders, which Lenders can then trade on secondary markets to enhance liquidity. In the event of a borrower's default, Lenders receive incrementally slashed funds from the Vouchers' staked collateral, providing a built-in layer of protection for their principal.

Vouchers play a critical role in KIN's undercollateralized lending framework by staking their own existing tokens (such as CRDD, ETH, LISA, or USDS) to back Borrowers and absorb potential losses. Vouchers submit customized offers, specifying their maximum slash amount, an upfront fee for the Borrower, and their share of the APR or participation in a bonus pool. The incentives earned by Vouchers from successful vouching are automatically deposited into a permanent, non-withdrawable Reputation Endowment, which serves as a tangible representation

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of their established trustworthiness and reputation within the ecosystem. Furthermore, Vouchers can leverage up to 50% of their Reputation Endowment as additional collateral for new vouchers, enabling them to back more loans without requiring new external capital and reinforcing a self-regulating, community-driven financial system.

Dynamic Vouching System

KIN Protocol's Dynamic Vouching System is a cornerstone of its undercollateralized lending model, allowing for flexible and community-driven risk assessment. Vouchers actively participate by submitting custom offers that define their commitment: a Max Slash Amount, an Upfront Fee paid by the borrower upon acceptance, and their share of the loan's APR or participation in a bonus pool. Borrowers review these offers and select those that best suit their loan terms, paying the upfront fee to the chosen Vouchers. The system is designed to guide potential Vouchers through a "Preferred Vouch Profile" for ideal risk and fee structures. A loan moves forward once it achieves full vouch coverage, meaning enough staked tokens are committed to cover the lenders' principal in case of a default, thereby reducing lender risk and democratizing capital allocation.

At the technical core, the vouching system relies on several interconnected smart contracts. Vouchers stake existing tokens such as CRDD, ETH, LISA, or USDS, which are held by a dedicated Collateral contract. This contract ensures that staked funds are committed to the loan contract and are subject to a one-month hold if the borrower defaults. If a borrower fails to make repayments, the system triggers incremental slashing of the Vouchers' staked collateral, with the slashed funds directly transferred to the lenders. Successful vouching, however, results

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in earned incentives (upfront fees and APR shares) being automatically deposited into a permanent, non-withdrawable Reputation Endowment managed by the Rep_Endowment smart contract. This endowment serves as a tangible measure of a Voucher's trustworthiness, and up to 50% of its value can be leveraged as additional collateral for new vouches, fostering continued participation and strengthening the ecosystem. The Credit_Bureau smart contract also records borrower behavior, impacting their credit score, while the Rep_Endowment_Ledger maps each Voucher's address to their respective Rep_Endowment contract.

Reputational Endowment

The Reputation Endowment within KIN Protocol is a core innovation, envisioned as an "Eternal Bond" that fundamentally redefines a voucher's accumulated trustworthiness and financial standing. This smart contract is designed to hold a voucher's earned incentives from successful vouching, primarily in ETH and other whitelisted assets, in perpetuity, with the principal value being permanently locked and non-withdrawable. Instead of direct withdrawal of all earnings, rewards generated solely from the staking of this endowment are claimable, creating a perpetual income stream for the voucher. This mechanism ensures that a voucher's commitment and success are tangibly represented and continuously grow, solidifying the KIN Protocol's vision of "reputation as the new collateral" within a decentralized financial ecosystem.

The design of this perpetually staked endowment offers significant long-term advantages, potentially creating a self-sustaining source of wealth. As the endowment primarily comprises ETH, its value could theoretically benefit from future appreciation in Ethereum's market price, enhancing the overall worth of the staked principal and, consequently, the perpetual rewards

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generated. This enduring income stream, continually fed by a voucher's successful participation and compounded through staking, holds the potential to provide lasting financial support, conceivably for future generations. Furthermore, to incentivize active participation and leverage established trust, vouchers are empowered to utilize up to 50% of their Reputation Endowment as additional vouch collateral for new loans. This feature allows them to back more borrowers without injecting new external capital, effectively monetizing their long-term trustworthiness and reinforcing their integral role in fostering a robust, community-driven lending system.

Kin Credit Bureau

The Credit Bureau within KIN Protocol is a pivotal pair of smart contracts designed to establish and maintain a borrower's creditworthiness in a decentralized manner, embodying the vision of "reputation as the new collateral". Each borrower address is associated with a unique Credit_Bureau smart contract, which keeps a detailed credit report. This contract determines a borrower's score by calculating the amount of payments made, the value of payments made, and the frequency of late payments. To ensure fairness and enable rehabilitation, the importance of these payment behaviors decays over time, meaning a borrower's score can be recovered with consistent good behavior and conversely, damaged by poor repayment history. Scores are assigned on a graded scale from F to A, with A representing the highest creditworthiness. Furthermore, the Credit Bureau contract integrates information from external identity and reputation services such as Galxe, Civic, and Ontology, which provide web3 credentials, optional KYC, and on-chain credit scoring, respectively. This aggregation forms the comprehensive KIN Reputation Score (KRS), a dynamic metric that evolves with each loan cycle.

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These credit reports are meticulously tracked through the seamless interaction of several smart contracts within the KIN ecosystem. The `Credit_bureau_ledger` smart contract plays a foundational role by maintaining a direct mapping between each borrower's address and their unique `Credit_Bureau` smart contract, ensuring that no single address can have more than one credit score. As loans progress through their lifecycle, the Loan contracts themselves are programmed to enforce repayment schedules. During "Phase 2" of a loan, the contract actively monitors for expected repayments within specified timeframes. If a payment deadline is missed, an automatic "slashing" event occurs, and critically, a message is sent to the relevant `Credit_Bureau` contract to update the borrower's credit report to reflect the missed payment. Conversely, upon full and timely repayment, in "Phase 3," another message is dispatched to the `Credit_Bureau` contract, signaling positive behavior and contributing to an improved credit score. This direct, on-chain communication between loan contracts and the Credit Bureau, facilitated by the `Credit_bureau_ledger`, ensures that all payment behaviors are accurately recorded and dynamically impact a borrower's reputation without reliance on centralized intermediaries.

NFT Backed Loans

When a loan within the KIN Protocol reaches full funding, a unique NFT-backed loan Token is minted. This Non-Fungible Token (NFT) serves as a digital representation of the loan agreement, encapsulating all critical information and stakeholder identities directly on the blockchain. The metadata embedded within this NFT is comprehensive, detailing the specific loan terms such as the loan amount, Annual Percentage Rate (APR), and repayment schedule. Furthermore, it clearly identifies the borrower by address, and the loan contract address, along

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with the crucial vouch coverage and slashing parameters that define the risk management for that particular loan. This innovative use of NFTs transforms a traditional financial instrument into a transparent, on-chain asset, with every aspect of the agreement immutably recorded.

A significant feature of these NFT-backed loan contracts is their transferability on secondary markets, enhancing liquidity within the KIN ecosystem. Lenders who have funded a loan and received its corresponding NFT can sell their positions to other interested parties, allowing them to exit their investment before the loan's natural maturity. This capability is a key development for the KIN Protocol, with plans for a dedicated NFT marketplace (Bidify Auction) explicitly mentioned in its roadmap. This not only provides flexibility for lenders by creating new DeFi trading opportunities but also adds a layer of liquidity to what would otherwise be illiquid loan agreements. The ability to trade these loan contracts on open markets underscores KIN's commitment to creating a dynamic, decentralized financial system where trust and transparency are paramount.

Risk Management

The KIN Protocol implements a robust Risk Management Framework to provide lenders with multiple layers of protection and transparency, particularly in its undercollateralized lending model. A primary mitigation strategy involves Vouchers, who stake their own tokens (CRDD, ETH, LISA, USDS, or other whitelisted assets) to back borrower loans. Each voucher defines a Max Slash Amount, indicating their willingness to risk their staked collateral. Should a borrower miss repayments, the system triggers incremental slashing of the vouchers' staked funds, which are then directly transferred to the lenders to cover the missed principal and interest. This

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mechanism can provide full principal protection for lenders if the total vouch coverage matches the loan amount, offering low-risk options for more conservative investors. Lenders are empowered to make informed decisions by selecting loans based on the level of voucher backing, allowing them to manage their exposure to risk.

Complementing the voucher system, KIN Protocol utilizes the Credit Bureau smart contract to dynamically assess and track borrower creditworthiness, embodying the concept of "reputation as the new collateral". The Credit Bureau calculates a borrower's score by analyzing the amount of payments made, the value of those payments, and the frequency of late payments, with the importance of these behaviors decaying over time to allow for reputation recovery. This on-chain credit report, assigned a grade from F to A (A being the best), is further enriched by integrating data from third-party identity and reputation services such as Galxe, Civic, and Ontology, forming the comprehensive KIN Reputation Score (KRS). Lenders can leverage these transparent reputation scores (KRS) and detailed vouch coverage metrics to filter and choose loan opportunities, gaining full visibility and control over the risk associated with their investments. This multi-faceted approach ensures that lenders have the necessary information and safeguards to mitigate risk within the decentralized ecosystem.

Closing Thoughts

The KIN Protocol stands as a pioneering decentralized, undercollateralized lending platform, fundamentally reshaping the landscape of DeFi by positing that "reputation is the new collateral". Our vision is to cultivate a financial ecosystem rooted in trust, reputation, and community, thereby unlocking unparalleled opportunities for entrepreneurs, freelancers, and

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various communities globally, particularly those in developing regions often excluded from traditional financial systems. By empowering borrowers to define their own terms, enabling lenders with transparent risk control, and incentivizing vouchers through a dynamic system, KIN transcends the limitations of overcollateralized DeFi and centralized intermediaries. This architecture, distinguished by its absence of a native token, borrower-led loan creation, and on-chain-only trust system enforced via smart contracts, alongside tradable NFT-backed loan contracts, creates a liquid, flexible, and robust environment. KIN Protocol is dedicated to fostering global economic inclusion and empowering individuals to build credit and access fair financing through a system where trust isn't merely given, but rigorously earned.

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