Karrier One: Simplifying Global Networks Through Telecom Orchestration

Karrier One Inc.
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Abstract

Karrier One is a transformative telecom orchestration platform designed to simplify the creation of global networks. By providing a suite of telecom solutions that coordinate wireless infrastructure—including LTE, 4G, 5G, 6G, and Wi-Fi hotspots—spectrum management, phone numbers and eSIM provisioning, and wireless roaming, Karrier One unifies these critical components into a cohesive ecosystem. This platform uniquely addresses the challenges of network densification and coverage gaps, offering a seamless, smart contract-enabled environment that bridges traditional telecom providers with decentralized wireless initiatives. By streamlining operations and fostering collaboration, Karrier One paves the way for an integrated, efficient, and accessible global telecommunications network.

1. Introduction

In an era where connectivity is paramount, the telecommunications industry faces significant challenges due to fragmentation and lack of integration among various network components and providers. Dead zones, limited bandwidth, and high operational costs hinder the realization of a truly ubiquitous global network. The proliferation of wireless technologies—from LTE to emerging 6G networks—and the complex management of spectrum and roaming agreements further complicate the landscape.

Karrier One addresses these challenges head-on by introducing a telecom orchestration platform that unifies key aspects of telecommunications. By coordinating wireless infrastructure across multiple technologies, efficiently managing spectrum, seamlessly provisioning phone numbers and eSIMs, and streamlining wireless roaming, Karrier One simplifies the complexities inherent in building and operating global networks.

The platform leverages blockchain technology and smart contracts to enable telecom equipment providers, operators, and decentralized wireless (DeWi) initiatives to interact within a unified ecosystem. This mirrors the collaborative nature of traditional roaming agreements but enhances it with the transparency, security, and efficiency of decentralized technologies. Compliant with telecom regulations, Karrier One's platform ensures that both traditional and emerging players can participate and benefit, fostering a more integrated and sustainable telecommunications ecosystem.

By simplifying the creation and management of global networks, Karrier One not only bridges existing gaps in the telecommunications landscape but also sets the stage for future innovation and expansion. Through its unique coordination of wireless infrastructure, spectrum, phone numbers/eSIMs, and roaming agreements, the platform empowers providers to deliver seamless connectivity worldwide, meeting the ever-growing demands of our interconnected world

Note: This whitepaper signifies an ongoing project. Our commitment is to continually update this document to reflect our most recent developmental progress. Given the evolving and iterative nature of our development process, it's expected that the final code and implementation may not exactly match the representation in this document.

2. Network Overview

In order for Karrier One Network to operate, a distributed network is established according to the following architecture.

2.1 The Karrier DAO

The Karrier DAO serves as the decentralized autonomous organization (DAO) that governs the Karrier One Ecosystem. The Karrier DAO acts as the essential governance for the Karrier One network, functioning like the system's central nervous system that ties all diverse types of nodes together. This decentralized system is charged with initiating improvement proposals to consistently improve the Karrier One ecosystem. It achieves this through a model of liquid democracy where KONE ticket holders cast votes on proposals that guide the development of the Karrier One ecosystem. Once a proposal secures approval, it's implemented autonomously or through the central conduit.

The Karrier DAO manages communication among all nodes and subsystems across the network. This DAO acts as a go-between and translator for the KNS module, telecom module, and blockchain. It also facilitates communication between hotspot Nodes, and Operator Nodes while interfacing with third-party applications. The primary responsibilities of this module include:

- Processing user registration and proposals
- Voting in and assigning hotspot, Deployer, and Operator Nodes to the network
- Managing and recording different quality metrics in the blockchain
- Simplifying the complexity of the business logic for the rest of the system
- Enforcing rules and contracts set in the blockchain by the telecom module

The Karrier DAO operates by allowing users to stake KONE governance tokens to deployer nodes and create voting “Tickets”. Any user can create a Ticket, collectively representing the community's will, steered through algorithms. Tickets are similar to accounts where advance notice for withdrawals must be provided, with the duration of this notice period known as the "withdrawal delay". The voting power of Tickets and their claim to voting rewards is proportional to the amount of staked KONE. Tickets can vote either manually or automatically by following other tickets, illustrating the concept of liquid democracy.

The Karrier DAO assures no single company, small group of developers, or node operators has undue influence or control over the network. Additionally, the Karrier DAO ensures that nodes receive appropriate compensation for their services.

Ticket holders are engaged in a crypto economic game, where they are incentivized to vote for the approval or rejection of proposals, or to set up ticket followings that lead them to vote automatically in a manner most likely to increase the long-term value of the Karrier One Chain network.

2.2 Karrier Improvement Proposals (KIPs)

Karrier Improvement Proposals (KIPs) are formal mechanisms for introducing enhancements, new features, or changes to the Karrier One ecosystem. Governed by the Karrier Decentralized Autonomous Organization (DAO), KIPs enable KONE token holders to actively participate in the decision-making process that shapes the network's future. Through a liquid democracy model, users stake their KONE tokens to create voting "Tickets," which grant them the power to vote on various proposals. This system ensures that the development and evolution of Karrier One are guided by the collective will of its community, rather than a centralized authority.

Once a KIP is proposed, it undergoes a voting process where Ticket holders can either vote directly or delegate their voting power by following other Tickets. Approved proposals are implemented autonomously or through designated channels, facilitating continuous improvement while maintaining network decentralization. KIPs play a crucial role in ensuring transparency, fairness, and adaptability within the Karrier One platform, allowing it to evolve in response to the needs and insights of its diverse user base.

3. Types of Modules

The Network comprises multiple software modules that interact through a central conduit controlled by the Karrier DAO. Modules contribute various layers, including

- Orchestration/Identity module (Karrier Number System (KNS))
- Ledger/blockchain module
- Telecom/communication module

3.1 Orchestration/Identity Module

The Karrier Number System (KNS) serves a dual role within our ecosystem: it functions both as an identity module and as an orchestration platform. As an identity solution, KNS enables users to connect their phone number and identity to their Web3 wallet, generating a digital ID. This digital ID allows users to send and receive funds or establish an identity anchored to their phone number ownership, all while ensuring that personal details remain secluded from the Web3 layer.

Beyond identity management, the KNS platform acts as the orchestration module that coordinates spectrum allocation, roaming agreements, and wireless infrastructure deployment. By centralizing these critical functions, KNS ensures seamless integration and operation across the network's decentralized components.

Moreover, the KNS platform empowers users to manage their Decentralized Physical Infrastructure Network (DePIN) devices directly. Through a unified interface, users can monitor device performance, configure settings, and oversee their contributions to the network.

3.2 Digital Identity

The Karrier Numbering System (KNS) is designed to act as a conduit between the traditional Web2 and the evolving Web3 domains. Conventional communication systems fall short of providing the fundamental attributes that enable digital engagement with financial systems, while Web3 offers enhanced digital access to blockchain ecosystems that have Decentralized Finance (DeFi) as their financial infrastructure. The amalgamation of the two allows users to have a wallet directly associated with their phone number. This simple yet powerful integration enables smooth transactions, facilitating effortless payments and augmenting the potential for peer-to-peer exchanges.

Among the primary features we aim to introduce with the launch of Karrier Number System (KNS), we are focusing on a selection of core functionalities. These features are designed to provide an optimal balance of security, convenience, and innovation. Here's a detailed overview of the initial key features that we plan to roll out with the release of KNS:

- **Protection Against SIM Swaps:** The KNS Sim swap protection feature is a significant innovation that safeguards users against SIM swap attacks, allowing them to manage their phone number with the same security as their digital assets.
- **Phone Calls and SMS:** Users can engage with their existing phone contacts using the globally routable numbers provided by KNS.
- **Anti-Spam and Phishing Measures:** Karrier One's KNS is equipped with robust mechanisms to combat spam and phishing attempts, ensuring a secure communication experience.
- **Effortless Crypto Transactions:** The virtual mobile number provided by KNS can be linked to a user's Web3 wallet address, streamlining the process of sending and receiving cryptocurrency without the need to share the full wallet address.
- **Number Portability:** Allows users to port their existing mobile numbers into the KNS ecosystem, ensuring a seamless transition and continuity of their current contacts.

Other features planned for KNS include:

- **Encrypted Communications:** KNS offers end-to-end encrypted voice and messaging services between its unique network addresses, while also maintaining connectivity with traditional mobile subscribers.
- **Web3 Transaction Alerts:** Users can receive secure notifications for Web3 transactions as text messages or push notifications, controlling who can contact them and for what purposes.

3.4 Orchestration Platform

The Karrier Number System (KNS) is not only a gateway between traditional Web2 and innovative Web3 technologies through digital identity but also serves as a sophisticated

orchestration platform. This orchestration module is essential in harmonizing various critical components of the decentralized network, ensuring efficient coordination of spectrum allocation, roaming agreements, and wireless infrastructure deployment. By centralizing these complex operations, KNS enhances operational efficiency and seamless integration across the network's decentralized elements.

Among the primary features we aim to introduce with the launch of the KNS orchestration platform, we are focusing on a selection of core functionalities designed to optimize network performance, security, and user empowerment. The initial key features of the KNS orchestration platform include:

- **Spectrum Management**: The orchestration platform enables operators to contribute their unused or underutilized spectrum to the network, allowing them to monetize these assets effectively. By integrating their spectrum resources into the network, operators can generate revenue from spectrum that might otherwise remain idle. This collaborative approach not only benefits the operators but also enhances the overall network capacity and performance, ensuring optimal utilization of available spectrum and reducing interference.
- **Roaming Agreement Coordination**: KNS facilitates seamless roaming by orchestrating agreements between different network operators and service providers. Users can move across different network zones without losing connectivity, experiencing uninterrupted service regardless of their location.
- **Wireless Infrastructure Deployment Management**: The platform oversees the deployment, configuration, and maintenance of wireless infrastructure components such as base stations and access points. Centralized management accelerates infrastructure rollout and ensures consistent network coverage and quality.
- **DePIN Device Management**: Empowering users to directly manage their Decentralized Physical Infrastructure Network (DePIN) devices, the KNS platform provides a unified interface for monitoring device performance, configuring settings, and tracking contributions to the network. This promotes user engagement and decentralization.

The KNS orchestration platform represents a significant advancement in how decentralized networks are managed and operated. By focusing on both technical excellence and user accessibility, it lays the foundation for a resilient, efficient, and user-centric telecommunications ecosystem.

3.5 Blockchain Module

The blockchain module is built upon the Sui Blockchain, leveraging its high-performance and scalable infrastructure to maintain a decentralized ledger that records all network transactions. The choice of Sui Blockchain allows for efficient transaction processing and enhanced security features inherent in its architecture.

For efficiency, privacy, and cost considerations, transaction data is partitioned between a public, anonymized ledger and a private component that houses all transaction details in an encrypted, distributed ledger. This dual-ledger approach ensures transparency and immutability on the public side while maintaining confidentiality and data integrity on the private side.

By utilizing the Sui Blockchain, the module benefits from features such as fast transaction finality and Move-based smart contracts, which enhance the overall efficiency and security of the network.

The blockchain module provides security, immutability, transparency, and privacy. Key functions of the blockchain include:

- **Managing Financial Ledgers**: Recording user account balances and transactions with accuracy and integrity.
- **Overseeing Reward Mechanisms**: Ensuring automatic payments to nodes once smart contract conditions are met, fostering a reliable incentive structure.

3.6 Telecom Module

The Telecommunications Module plays a crucial role within the comprehensive architectural design, taking charge of several vital operations:

- **Call Signaling**: Facilitates the setup and teardown of calls within the signaling layer, ensuring efficient and reliable communication initiation and termination.
- **Media Routing**: Handles the media layer for voice and video communications during calls, optimizing the pathways for minimal latency and maximum quality.
- **Message Routing**: Manages the messaging layer for the transmission of Peer-to-Peer (P2P) and Short Message Service (SMS) messages, ensuring timely and secure message delivery.
- **Service Management**: Processes service requests, including provisioning, activation, and deactivation of services, while maintaining service catalogs and profiles.
- **Quality of Service (QoS) Monitoring**: Conducts analysis and real-time tracking of network quality, including metrics like Mean Opinion Score (MOS), jitter, packet loss, and bandwidth utilization to maintain high service standards.
- **Self-Healing Network**: Applies analysis and algorithms for network operation and updates of distributed routing tables, enabling the network to automatically detect and recover from faults or suboptimal conditions.
- **Distributed Hash Tables for Nodes**: Maintains node address tables essential for routing, supporting efficient lookup and data retrieval in the decentralized network.
- **Interoperability**: Ensures compatibility with existing telecommunications standards and protocols, facilitating seamless interaction between traditional telecom infrastructures and the decentralized network.
- **Scalability and Performance Optimization**: Adopts scalable network architectures and optimization techniques to handle increasing user loads without compromising performance.
- **Support for DePIN Devices**: Integrates with Decentralized Physical Infrastructure Network devices, leveraging user-managed hardware to expand network coverage and resilience.
- **Compliance and Regulatory Adherence**: Incorporates features to comply with telecommunications regulations, including emergency services access and lawful interception capabilities where legally required.

- **Support for Emerging Technologies**: Prepares for integration with next-generation technologies like 5G and IoT, ensuring the network remains relevant and capable of supporting future services.

4. Types of Nodes

The proposed network model is composed of three distinct node layers:

- **Deployer Nodes:** These nodes are operators of radios that utilize unlicensed and licensed spectrum. Deployer nodes must stake a certain number of KONE tokens to participate in the network.
- **Hotspot Nodes:** These nodes supply supplemental coverage and wireless access to the network. Hotspot nodes must pay a small registration fee in KONE to participate in the network.
- **Operator Nodes:** These nodes create a bridge to traditional telecommunications operators, ensuring seamless integration.

4.1 Deployer Nodes

Deployer Nodes form the backbone of the Karrier One network. These nodes are pivotal in maintaining the network's economic and operational structure.

Anyone looking to install Karrier One radios that utilize license and unlicensed spectrum must first become a Deployer Node. Operators of Karrier One radios must stake a certain number of KONE tokens to participate in the network. Rewards are distributed to validators based on the amount of data transmitted.

Depending on capacity and location needs, Karrier One radios installed by deployers can be deployed in various hardware configurations, serving anything from a single user to an entire community.

Deployers must ensure high availability. Failing to meet uptime requirements could result in reduced rewards. Deployers that act maliciously or fail to maintain network standards could have a portion of their staked tokens slashed.

4.2 Hotspot Nodes

Hotspot Nodes play a crucial role in expanding and enhancing the coverage of the Karrier One network. These nodes are WiFi hotspot devices that provide supplemental wireless access, bridging gaps in areas where coverage may be limited or in need of augmentation. Ranging from indoor to outdoor units, Hotspot Nodes can be installed by anyone willing to contribute to the network's growth and reliability.

To set up and register a Hotspot Node, operators are required to pay a small, fixed fee in KONE tokens. This accessible entry point encourages widespread participation, enabling individuals and businesses to become part of the network with minimal barriers.

Hotspot Nodes are essential to the decentralized ethos of the Karrier One network, empowering individuals and organizations to actively participate in building and sustaining a robust, wide-reaching wireless infrastructure. By providing supplemental coverage and facilitating wireless access, Hotspot Nodes enhance the network's reliability and performance, ensuring users have consistent and high-quality connectivity wherever they are.

4.3 Operator Nodes

The Operator Nodes function as a bridge to traditional telecommunications networks, managing protocol translations, media transcoding, and directing traffic to these networks. A minimum of one Operator Node per country is required to ensure service provision. Operators of these nodes must comply with local regulations and possess the requisite licenses to administer the service.

Within the network infrastructure, operator nodes are pivotal for overseeing off-chain transactions, which encompass activities such as roaming and spectrum agreements.

It's crucial to differentiate the reward structure in this context. Rewards stemming from these off-chain agreements vary from those derived from on-chain transactions and services. Furthermore, these rewards are subject to a predefined lockup duration.

5. Node Quality of Service

The network employs a node quality grading system, serving as a core source of information to regulate quality control and motivate node operators through incentive mechanisms.

This grading system relies on historical quality and health check parameters, such as local latency between nodes, jitter checks, packet loss, upload and download speed tests, node uptime, and a variety of other metrics, coupled with mean opinion scores. These quality grades, detailing aforementioned parameters for each node, will be made publicly accessible to node operators and the general public.

Nodes that fall below a specified grade threshold will be excluded from the selection pool for ongoing communication handling until an improvement in their grades is noted. This improvement is based on enhanced performance during automated background health checks.

6. Users on the Network

A network user is characterized as an individual who employs the services offered on the network. These services, which initially comprise a range of communication services such as wireless access, multimedia, and messaging, are diverse. Using these services necessitates the expenditure of a transaction fee in the form of a digital token.

Each user seeking to connect to the network must first pass through a hotspot or Deployer Node’s radio. In an ongoing manner, these devices relay critical information to the mobile

core, enabling real-time evaluation of performance metrics and facilitating instantaneous accounting for each active session. These devices provide coverage for a specific area and are positioned in places where connectivity is needed.

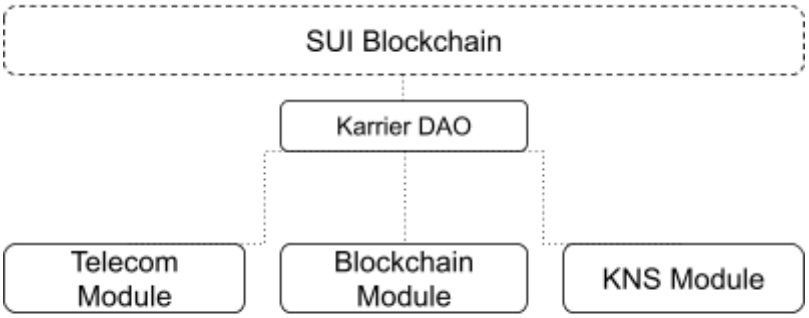
Consequently, as the number of network users grows, so does the usefulness of this digital token. The provision of additional services further boosts the demand and utility of the token. Moreover, users have the ability to conduct peer-to-peer transfers of their digital tokens, facilitating the sharing and distribution of this network utility to others.

Establishing mobility through the Karrier One dashboard account offers the advantage of accessing the telecom layer even to those users who lack expertise in Web3, while simultaneously providing them the choice to utilize the full potential of the blockchain along with their service. Users can acquire a Web3 wallet that enables them to delve into every aspect of the blockchain. Our Zero Knowledge web interface simplifies the process of accessing decentralized applications (dApps) at the telecom level, hence making blockchain utilization uniquely straightforward. This is a stark contrast to the conventional adoption of blockchain, which is often hampered by its complex nature.

7. Selection of Blockchain

Our decision to use SUI blockchain for our solution allows us to leverage the unique capabilities of SUI, aiming for optimal levels of scalability, speed, cost-efficiency, security, and decentralization.

Karrier One Architecture



Karrier One Ecosystem Architecture

While not the primary focus of this paper, here is a summary of the key considerations, advantages, and benefits of choosing the SUI blockchain:

- **High Scalability and Speed:** SUI blockchain's design emphasizes high transaction throughput and low latency, which is crucial for the telecommunications and wireless connectivity industry. This ensures that Karrier One can handle a large volume of transactions efficiently.

- **Advanced Security Features:** SUI employs state-of-the-art cryptographic techniques and a robust consensus mechanism, enhancing the security and integrity of transactions on Karrier One Chain.
- **Ease of Use for Developers and Users:** SUI is designed with usability in mind, making it easier for Karrier One to develop, build, and interact with it.
- **Innovative Consensus Mechanism:** The unique consensus mechanism of the SUI blockchain can potentially improve the efficiency of Karrier One while reducing its environmental impact.
- **Smart Contract Capabilities:** The support for smart contracts on SUI enables Karrier One to host a wide range of decentralized applications (dApps) tailored to the needs of the telecommunications sector.
- **Interoperability and Flexibility:** The SUI blockchain is expected to offer a high degree of interoperability with other systems, facilitating seamless interaction and integration with various stakeholders and platforms.
- **Governance through Karrier DAO:** The decentralized nature of SUI allows for granular management of Karrier One through Karrier DAO, encompassing everything from validator selection to transaction governance, ensuring a secure and effectively governed platform.
- **Access to Cutting-Edge Technology:** By adopting SUI, Karrier One can utilize the latest technological advancements in the blockchain space, ensuring that the platform remains at the forefront of innovation in the telecommunications and wireless connectivity industry.

7.1 Use of Smart Contracts

The integration of blockchain technology and smart contracts through the SUI blockchain presents a significant shift for established telecommunications providers. This shift arises from the disruption of traditional business models that have operated for decades on centralized infrastructures. Our approach requires reimagining these business models, grounding them on the SUI blockchain, with smart contracts as the core of their operations.

Integrating the Move programming language and its smart contracts could significantly enhance the operations of established telecommunications providers. Here's how the concepts from Move can be incorporated into the existing framework of the SUI blockchain for telecommunications:

- **Object-Centric Approach with Unique Identifiers:** Move on Sui utilizes an object-centric storage model without global storage. This means each object, representing user-level assets like billing or roaming agreements, will have a unique identifier. This aligns with the need for accurate and consistent data in telecom operations.
- **Efficient Transaction Processing:** Move on Sui eliminates global storage and related operations, allowing transactions to specify all inputs upfront using unique identifiers. This can lead to improved time optimization and cost efficiency, as telecom transactions can be processed more quickly and without the need for extensive intermediary involvement.
- **Enhanced Security and Integrity:** The key abilities and the unique ID system in Move on Sui ensure that each object is secure and distinct. This directly contributes

to risk mitigation and data integrity in the telecom sector, reducing the vulnerability to tampering and fraud.

- **Module Initializers for Customization:** Telecom operators can use Move's module initializers to pre-initialize data specific to their operations. This could mean setting up initial states for smart contracts governing billing cycles or roaming agreements.
- **Entry Points for Object Manipulation:** The ability to manipulate objects by value or by reference in Move on Sui offers telecom providers flexibility in managing contracts and customer data. This can lead to dispute minimization and trust amplification as changes to contracts or agreements are transparent and trackable.
- **Adaptability and Improved Throughput:** Move's adaptability to different blockchains, particularly its optimized implementation on Sui, can help telecom operators efficiently handle a large volume of transactions while maintaining high throughput and reducing delays in finality.
- **Developer Ecosystem and Common Libraries:** By leveraging Move's open-source nature and its common libraries, telecom providers can tap into a wide range of tools and a community of developers for continuous improvement and innovation in their blockchain-based operations.

In summary, the integration of Move with the SUI blockchain can revolutionize telecommunications by providing a more secure, efficient, and transparent framework for managing contracts and data. This will ultimately benefit end consumers with faster, more reliable, and accessible services.

8. Conclusion

In conclusion, Karrier One will introduce a new mobile network that allows anyone to create connectivity where they need it; seamlessly, securely, with maximum efficiency, and at speeds never thought possible before. Individuals, communities and businesses will be able to connect with one another in a frictionless environment where complete trust is built in, privacy complements transparency and users are empowered owners of their identities.

Karrier One sets out to establish the first commercial grade, community-owned telecom network infrastructure in the world, that will be able to provide services to other network carriers as well as to its own private user base, through a combination of both licensed and unlicensed radio spectrum. Our goal is to decentralize wireless infrastructure and democratize mobile network access by creating a new type of global telecommunications layer, in which consumers can also be service providers and stakeholders simultaneously. We believe consumers all over the world should experience a higher quality of service and should be able to pay lower mobile access tariffs, based on fair pricing principles, without having to stand for unjustified heavy premiums made possible by lack of competition and unfair advantages.

Token Allocation

Allocation	Years Vested	% of Total	# of Tokens
Team	1 Year Lock + 36 Months	15%	450,000,000.00
Advisor	1 Year Lock + 36 Months	5%	150,000,000.00
Seed	1 Year Lock + 36 Months	5%	150,000,000.00
Airdrop	N/A	5%	150,000,000.00
Device Rewards Pool	N/A	40%	1,200,000,000.00
Community Growth and Marketing	N/A	10%	300,000,000.00
Governance and DAO Participation	N/A	10%	300,000,000.00
Reserve Fund	N/A	10%	300,000,000.00
Total Tokens		100%	3,000,000,000.00

Explanation of Allocations:

- **Team (10%) and Advisors (5%):** Allocations reflect the project's commitment to community participation while ensuring the team and advisors are vested in the long-term success.
- **DePIN Device Rewards Pool (40%):** A significant portion allocated to reward users who install and maintain DePIN devices, incentivizing network growth.
- **Community Growth and Marketing (10%):** Funds allocated to promote the network, attract new participants, and support community initiatives.
- **Governance and DAO Participation (10%):** Tokens reserved to reward active participation in network governance through the Karrier DAO.
- **Reserve Fund (10%):** Set aside for future needs, unforeseen expenses, and strategic opportunities.