



QI Blockchain

The Only Blockchain You'll Ever Need

1. Introduction	3
1.1 What is QI?	3
1.1.1 Why QI Embraces Blockchain Technology?	4
1.2 Background Information on the Problem	4
1.2 Overview of QI Blockchain and Its Objectives	5
1.3 Mission & Vision	8
2. Technology	8
2.1 Blockchain Architecture	8
2.2 Consensus Mechanism	9
2.2.1 What is Proof of Stake?	10
2.2.2 QI Blockchain's Implementation of PoS	10
2.2.3 Why Transition to Proof Of Stake?	12
2.2.4 Migration Process	13
2.3 Network Protocol	14
2.4 Block Rewards on the QI Blockchain	15
2.5 Block time on the QI Blockchain	16
2.6 Scalability Solutions	17
2.7 Security Measures of QI Blockchain	18
2.8 How does QI Blockchain Benefit Developers?	19
2.9 Building and Deploying a QI Blockchain Full Node	21
2.9.1 Run a QI Blockchain full node	21
2.9.1.1 Starting a Full Node	23
2.9.1.2 Genesis File	24
2.9.2 How to become a Validator on the New QI Blockchain?	25
2.9.2.1 Steps for Validator Setup	26
2.9.2.2 Validator Registration and Activation	27
2.10 QI Blockchain CLI Parameters	29

Specifying options	29
2.11 API Documentation and Developer Resources.....	31
2.11.1 API Documentation.....	31
2.11.2 RPC API.....	31
2.11.2.2 QIE methods.....	32
Parameters.....	33
3. QI Blockchain’s Existing Infrastructure and Ecosystem.....	47
3.1 Finance	47
3.2 Art & Collectibles	48
3.3 Gaming	49
3.4 Technology.....	50
4. QI Blockchain’s Applications and Use Cases	51
4.1 Target Markets and Customers	51
Target Markets for QI Blockchain	51
Customer Segments.....	52
4.2 Unique Features of the QI Blockchain	53
4.3 Competitive Landscape	54
5. QI Blockchain Tokenomics & QIE Token Overview	54

Disclaimer

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1.Introduction

1.1 What is QI?

Unlocking the Essence of QI Blockchain: Embracing Decentralized Vitality

QI Blockchain embodies more than just a technological innovation; it embodies a profound concept deeply rooted in the fabric of existence. Like the vital life force it's named after, QI represents the interconnectedness of all things, offering a source of power, vitality, and spiritual wisdom. In the digital realm, QI pronounced “chie”, transcends its literal translation, emerging as a ground-breaking decentralized blockchain platform. Operating on a Proof of Stake (PoS) consensus mechanism, QI facilitates the creation, management, and exchange of assets, both fungible and non-fungible, through sophisticated Remote Procedure Call (RPC) methodologies. Just as practitioners of ancient philosophies sought harmony and balance with the flow of QI, so too does QI Blockchain seek to harmonize and empower its users. It symbolizes the fusion of tradition and innovation, offering a pathway for individuals to embark on a journey of self-discovery and personal growth in the ever-evolving digital landscape.

With QI Blockchain, the essence of decentralized vitality pulsates through every transaction, empowering individuals to embrace the interconnectedness of the digital world and unlock new possibilities for innovation, collaboration, and prosperity.

The Technical Superiority of QI

QI's blockchain architecture is ingeniously designed to surpass traditional transaction processing capabilities significantly. It boasts the capacity to handle up to 650 times the transaction volume per second compared to Bitcoin, and 15 times more than the conventional SWIFT banking system. This remarkable scalability has positioned QI as the preferred blockchain infrastructure for numerous enterprises, enabling them to adopt it as the primary payment mechanism within various fully developed I-store applications that address real-world needs.

Tokenomics and Sustainability

The QI ecosystem is underpinned by a finite supply of 150,000,000 QIE coins, ensuring scarcity and value preservation. These coins are set to be released gradually over nearly a century, maintaining minimal transaction fees to promote a sustainable and cost-effective transactional framework. This approach not only underscores the platform's long-term vision but also aligns with the futuristic demands of digital transactions.

Empowering Decentralized Applications and Smart Contracts

At its core, QI is engineered to revolutionize the deployment and operation of smart contracts and decentralized applications (dApps). These applications thrive on the QI platform, free from downtimes, fraud, external control, or third-party interference. dApps represent a new paradigm

of digital applications that leverage the decentralized nature of blockchain networks, offering enhanced user privacy, resistance to censorship, and developmental flexibility.

The integration of blockchain technology within dApps enables the seamless processing of data across distributed networks, ensuring transparent and secure transactions. This foundational technology empowers QI to support a wide array of innovative applications across diverse sectors such as finance, web browsing, gaming, advertising, decentralized finance (DeFi), identity management, Web 3.0, the metaverse, and supply chain management globally.

QI as a Catalyst for Innovation

QI stands as a testament to the potential of blockchain technology to redefine the boundaries of digital transactions and application development. Its unique blend of high transaction throughput, scalable infrastructure, and a secure platform for dApps and smart contracts positions QI as a pivotal force in the evolution of decentralized digital ecosystems. As companies and developers worldwide continue to explore and integrate QI's capabilities, it paves the way for a future where digital transactions and applications are more efficient, secure, and aligned with the ethos of decentralization and user empowerment.

1.1.1 Why QI Embraces Blockchain Technology?

QI is a cutting-edge decentralized platform that leverages blockchain to facilitate secure, peer-to-peer transactions and smart contract executions without needing a central authority. This approach not only enhances transaction security but also supports the creation of immutable, decentralized financial contracts and applications.

Key Advantages of Blockchain for QI

- **Decentralized Security**
Blockchain's distributed nature ensures high security and reliability, eliminating single points of failure and reducing the risk of malicious attacks.
- **Transparent Verification**
It enables the immutable recording of transactions, simplifying the verification and traceability of complex transactions, thereby increasing transparency and reducing compliance costs.
- **Efficient Contract Management**
By automating contract execution through smart contracts, blockchain streamlines contract management, reducing disputes and enhancing efficiency.
- **Product Origin Verification**
Blockchain provides a tamper-proof ledger, facilitating the accurate verification of product origins and the integrity of supply chains.

Blockchain technology is integral to QI, offering a secure, efficient, and transparent framework for transactions and decentralized applications. By adopting blockchain, QI sets a new standard for security and user empowerment in the digital ecosystem.

1.2 Background Information on the Problem

The advent of blockchain technology heralded a new era of decentralized computing, promising an immutable ledger, trustless transactions, and a disintermediation of traditional financial and informational gatekeepers. However, as the technology matured and adoption increased, inherent limitations within the foundational designs of first and second-generation blockchains became apparent. These limitations manifest primarily in scalability bottlenecks, prohibitive transaction costs, and environmental sustainability concerns, with Ethereum's challenges serving as a prime example.

Scalability Bottlenecks

Central to the scalability dilemma is the trilemma positing that a blockchain cannot simultaneously achieve scalability, security, and decentralization without compromising on at least one aspect. Ethereum, as a second-generation platform, exemplifies this struggle. Characterized by a rigid block size and a consensus mechanism that, while secure, significantly limits transaction throughput, Ethereum's limitations become starkly pronounced under high network demand. This leads to congestion, delayed transaction confirmations, and an overall degradation of user experience.

Prohibitive Transaction Costs

Transaction fees on networks like Ethereum have become increasingly volatile and, at times, exorbitantly high. This volatility is directly tied to network congestion and the underlying mechanism of transaction fee calculation, which is based on market dynamics of supply (block space) and demand (transaction inclusion). For instance, when the price of Ethereum approaches \$4,000, the cost of transactions can become prohibitively expensive for users. In stark contrast, QI Blockchain's transaction fees are designed to be nominal, costing merely a penny in dollar terms. This dramatic difference in transaction costs underscores the need for a more scalable and cost-effective blockchain solution.

Environmental Sustainability Concerns

The Proof of Work (PoW) consensus mechanism, while providing robust security through cryptographic puzzles, is inherently energy-intensive. The competitive nature of mining, requiring significant computational power, leads to an escalating energy demand, contributing to environmental concerns. The carbon footprint associated with PoW blockchains, such as Ethereum, has drawn criticism, calling into question the long-term viability and ethical considerations of blockchain technologies reliant on such consensus mechanisms.

The Need for a Holistic Solution

The challenges outlined above underscore the pressing need for a holistic solution that addresses these fundamental issues without compromise. A next-generation blockchain must offer a scalable architecture, maintain high security and decentralization, ensure low transaction fees for greater financial inclusivity, and adopt an environmentally sustainable consensus mechanism. The QI Blockchain project is conceived as a direct response to these challenges, embodying a paradigm shift towards a more scalable, cost-effective, and sustainable blockchain

ecosystem. Through innovative architectural choices, including a Proof of Stake (PoS) consensus mechanism and sharding for scalability, QI Blockchain aims to resolve the limitations that have hindered the broader adoption and utility of blockchain technology. This approach not only addresses the scalability issues akin to Ethereum but also introduces a framework where transaction fees remain minimal, ensuring accessibility and fostering innovation within the blockchain space.

1.2 Overview of QI Blockchain and Its Objectives

QI Blockchain emerges as a revolutionary force in the realm of decentralized finance (DeFi) and blockchain technology, aiming to address the critical challenges that have plagued earlier generations of blockchain networks. With a keen focus on scalability, security, low transaction fees, and environmental sustainability, QI Blockchain is designed to be the ultimate layer-one solution for a vast array of applications, particularly in the DeFi sector. This whitepaper delineates the project's vision, architectural innovations, and strategic objectives, underpinning our commitment to creating a blockchain ecosystem that is accessible, efficient, and secure for developers, validators, and users alike.

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What's Changing in the QI Blockchain Ecosystem?

Transition to PoS: A New Era of Scalability and Sustainability

QI Blockchain stands at the precipice of a transformative era, heralding a shift towards a more sustainable, efficient, and user-centric blockchain ecosystem. This evolution is characterized by the transition from the traditional Proof of Work (PoW) system to an innovative Proof of Stake (PoS) model. This strategic pivot is driven by our unwavering commitment to environmental responsibility, enhanced network scalability, and bolstered security measures. Originally conceived as a PoW-based entity, QI Blockchain has rapidly evolved, embracing the complexities and demands of a burgeoning digital economy. Our platform, which has been a bedrock for decentralized applications (dApps) and enterprise blockchain solutions, now embarks on a groundbreaking journey with PoS at its helm.

Introduction of a New PoS-based Blockchain Infrastructure

The dawn of the QI Blockchain's PoS era signifies a leap towards an infrastructure that promises not only improved energy efficiency but also superior transaction speed and reliability. This new chain is engineered to incorporate state-of-the-art features, enhancing the user experience and expanding the utility of QIE, our native cryptocurrency. This transition not only underscores our dedication to innovation but also aligns with our vision of a scalable, secure, and inclusive blockchain ecosystem.

Seamless Migration of Assets

A cornerstone of this transition is the comprehensive and seamless migration of assets from the existing QI Blockchain to the new PoS-based framework. This includes QIE holdings, Qidex, staking contracts, and NFTs, ensuring a smooth transition for our community members without requiring any action on their part. This automatic and secure migration process exemplifies our commitment to user convenience and trust.

The Role of QIE in the QI Ecosystem

QIE, the lifeblood of the QI Blockchain, serves as a medium for computation market transactions, incentivizing participants to validate and execute transaction requests. This mechanism ensures the network's computational resources are utilized efficiently, preventing malicious actors from exploiting the system. The bounty model, where validators are rewarded with QIE, is designed to balance the computational cost with the incentive, fostering a secure and robust network environment.

Strategic Objectives and Innovations

➤ Enhanced Security and Efficiency

The adoption of PoS is instrumental in mitigating the risk of 51% attacks, thereby bolstering network security. By eliminating the energy-intensive mining process inherent in PoW, PoS offers a more sustainable and environmentally friendly alternative. This transition not only signifies our commitment to reducing the blockchain's carbon footprint but also enhances the network's efficiency and scalability.

➤ Fostering a Developer-Friendly Ecosystem

QI Blockchain is meticulously engineered to cater to the needs of developers. By retaining compatibility with the Ethereum Virtual Machine (EVM), we facilitate a smooth transition for developers proficient in Solidity, enabling them to leverage our platform's enhanced capabilities. Our comprehensive API documentation and robust RPC interfaces underscore our commitment to providing developers with the tools and resources necessary to innovate on QI Blockchain.

➤ Scalability and Low Transaction Fees

Addressing the scalability bottlenecks and high transaction costs associated with legacy blockchains, QI Blockchain implements sharding and maintains a nominal transaction fee structure. With block times set at five seconds per block and a block reward of 0.5 QI, our blockchain is optimized for high throughput and minimal latency, ensuring a seamless user experience.

➤ Tokenomics and Long-Term Viability

Our tokenomic model is meticulously designed to ensure long-term sustainability and growth. With 58 million QIE coins initially mined through PoW and an additional 92 million reserved for validator rewards, locked in a smart contract, we establish a transparent and equitable distribution mechanism. This model, coupled with a detailed plan for asset migration and reward

distribution over an estimated 140 years, underscores our commitment to community trust and network longevity.

➤ **Commitment to Transparency and Regulatory Compliance**

Acknowledging the importance of regulatory compliance, QI Blockchain emphasizes a framework that operates within the legal boundaries, ensuring a secure and compliant environment for users and developers alike. The absence of an ICO and the pre-launch operational status of our project mitigate security token risks, aligning with our ethos of transparency and trust.

As QI Blockchain transitions to a PoS-based ecosystem, we are not just embracing a new technological framework; we are setting a new standard for what a blockchain can achieve. Our focus on scalability, security, low fees, and environmental sustainability positions us as a beacon in the blockchain space, ready to meet the current and future demands of the digital economy. With the unwavering support of our community and a clear vision for the future, QI Blockchain is poised to redefine the landscape of decentralized finance and beyond, proving itself as the only blockchain the world will ever need.

1.3 Mission & Vision

Mission

To revolutionize decentralized finance by architecting a scalable, secure, and eco-friendly blockchain infrastructure. QI Blockchain commits to pioneering advancements in blockchain technology, enabling seamless, equitable access to decentralized applications and services. Our mission is grounded in innovation, sustainability, and the democratization of digital assets, striving to empower developers, validators, and users within a transparent and efficient ecosystem.

Vision

To establish QI Blockchain as the definitive platform for decentralized applications, setting new standards in performance, security, and environmental stewardship. We envision QI Blockchain as the backbone of a diverse digital economy, catalyzing innovation and inclusivity across financial and social spheres. Our vision is to drive global blockchain adoption, transforming how transactions and digital interactions are conducted, thereby shaping the future of decentralized finance.

2. Technology

2.1 Blockchain Architecture

The architectural foundation of QI Blockchain is meticulously engineered to address the quintessential challenges of scalability, security, and decentralization, leveraging a sophisticated blend of contemporary blockchain technologies and protocols. At the core of this architecture is the Proof of Stake (PoS) consensus mechanism, which serves as the linchpin for network security and operational efficiency. This section delves into the intricate details of QI Blockchain's architecture, emphasizing the consensus layer, node configuration, and the inclusive validator participation model.

Key Components of QI Blockchain Structure

➤ Proof of Stake (PoS) Consensus Mechanism

Central to its architecture, the PoS mechanism incentivizes validators to act in the network's best interest by staking their own tokens as collateral. This system not only reduces energy consumption but also enhances security and stakeholder alignment.

➤ Bootnodes and Validator Nodes

The network infrastructure comprises bootnodes and validator nodes. Bootnodes facilitate peer discovery and network connectivity, ensuring robustness and resilience. Validator nodes, initially set at four, are responsible for processing transactions, creating new blocks, and maintaining the blockchain's integrity. This setup is designed to be scalable, allowing for the addition of new validators to decentralize control further and enhance network security.

➤ Inclusive Validator Participation

QI Blockchain democratizes the validation process, allowing any participant to become a validator, subject to staking requirements. This inclusivity broadens network security and decentralization, creating a more resilient ecosystem.

➤ Dynamic Staking and Validator Incentives

Validators are incentivized through block rewards and transaction fees, with a dynamic staking mechanism in place to adjust for network growth and security needs. This ensures a fair and motivating reward system that encourages active and honest participation in the network.

➤ Decentralized Network Topology

The architecture supports a decentralized network topology, minimizing the risk of central points of failure and ensuring a distributed control mechanism across the blockchain. This topology is crucial for maintaining the integrity and availability of the network.

➤ High-Performance Computing Resources

Validator nodes are equipped with high-performance computing resources to handle transaction processing, block creation, and consensus participation efficiently. This ensures high throughput and low latency across the network.

➤ **Geographic Dispersion of Nodes**

To optimize network performance and ensure fault tolerance, nodes are geographically dispersed. This dispersion aids in reducing latency and enhancing the user experience while contributing to the network's resilience against localized disruptions.

2.2 Consensus Mechanism in QI

Consensus in blockchain technology is the foundational process that allows a network of computers, or nodes, to reach a unified agreement on the state of the network. This is achieved through a consensus protocol, which is essentially a set of rules or instructions that guide the network to a common understanding and ensure its integrity and security. The QI Blockchain, recognizing the critical importance of these principles, has made a significant leap forward with its V2 update by transitioning from the traditional Proof of Work (PoW) protocol to the more advanced and efficient Proof of Stake (PoS) mechanism.

2.2.1 What is Proof of Stake?

Proof of Stake (PoS) is a consensus mechanism that differs fundamentally from PoW in that it relies on the ownership, or "stake," of the cryptocurrency by validators as the primary resource for securing the network. Validators are chosen to create new blocks and confirm transactions based on the amount of cryptocurrency they are willing to stake as collateral. This approach not only enhances the energy efficiency of the network by negating the need for energy-intensive mining activities but also ensures rapid transaction processing with minimal latency, making the blockchain more scalable and accessible. Unlike PoW, PoS does not require specialized computer hardware, which lowers the barriers to entry and makes it less resource-intensive.

One of the standout advantages of the PoS system, especially as implemented in the QI Blockchain, is its enhanced security features, particularly against the notorious "51% attacks." In PoW systems, a party controlling more than half of the network's mining power could potentially manipulate the blockchain. However, in a PoS context, the risk of such an attack is significantly reduced. Attacking a PoS network becomes economically impractical, as it would require ownership of a majority of the cryptocurrency, an act that would inherently devalue the attacker's own holdings.

Consensus Protocol vs. Algorithm

It's important to distinguish between the terms 'algorithm' and 'protocol' in the context of blockchain consensus. While often used interchangeably, an algorithm refers to a set of computational rules used for problem-solving and calculations, whereas a protocol describes a

broader set of rules that dictate how different parts of a system operate together. This distinction underscores the comprehensive approach taken by consensus protocols in maintaining network security and integrity.

Historical Context and Evolution

Historically, consensus mechanisms have played a crucial role in establishing agreement among database nodes and application servers within enterprise infrastructure. In the blockchain domain, they are indispensable for maintaining consensus about the network's state.

The adoption of PoS by QI Blockchain signifies a forward-thinking approach to achieving consensus in a way that balances efficiency, security, and inclusivity. This transition not only aligns with the broader trend in the blockchain industry towards more sustainable practices but also positions QI Blockchain as a leader in adopting advanced technologies to meet the demands of a growing and evolving digital economy.

2.2.2 QI Blockchain's Implementation of PoS

➤ Staking Mechanism

Stake-Based Validation

In QI Blockchain, users can participate in the network's security and consensus mechanism by staking QI tokens. The number of tokens staked influences a user's likelihood of being selected as a validator. This approach encourages token holders to act in the network's best interest, as their potential reward is directly tied to the network's overall health and success.

➤ Validator Selection and Block Validation

Randomized Selection

QI Blockchain could use a randomized process to select validators, potentially weighted by the size of their stake and the duration of their participation. This method ensures fairness and decentralization in the validator selection process.

Multi-Signature Validation

For added security, QI Blockchain might employ a multi-signature scheme where a block must be validated by multiple validators before being added to the blockchain. This reduces the risk of fraudulent transactions and enhances the overall integrity of the network.

➤ Rewards and Penalties

Reward Distribution

Validators successfully participating in the block validation process receive rewards in the form of QI tokens. These rewards could come from transaction fees, block rewards, or a combination of both, incentivizing participation and honest behavior.

Slashing Mechanisms

To deter malicious actions, QI Blockchain implements a slashing mechanism where validators stand to lose a portion of their staked tokens if they act against the network's rules. This could include validating incorrect transactions or attempting to manipulate the consensus process.

➤ **Technical Enhancements and Governance**

Security Enhancements

Recognizing the potential vulnerabilities inherent in PoS systems, QI Blockchain incorporates additional security measures, such as cryptographic techniques to secure the validator selection process and transaction validation.

Governance Model

Leveraging the PoS mechanism, QI Blockchain introduces a governance model that allows token holders to vote on crucial network decisions. The voting power is proportional to the amount of QI tokens staked, ensuring that those most invested in the network have a say in its direction.

Scalability Solutions

To address scalability, QI Blockchain explores advanced solutions compatible with PoS, such as sharding or layer 2 scaling solutions, to process transactions more efficiently and at lower costs.

2.2.3 Why Transition to Proof of Stake?

As QI Blockchain propels forward in its trajectory of technological advancement and ecosystem expansion, our commitment to optimizing our infrastructure and enhancing the participatory experience of our community remains unwavering. The imminent transition from a Proof of Work (PoW) consensus mechanism to a Proof of Stake (PoS) paradigm represents a critical juncture in our evolutionary path. This transition transcends mere technical refinement; it embodies a strategic realignment towards cultivating a blockchain ecosystem that is inherently more sustainable, efficient, and inclusive. Below, we delineate the salient motivations underpinning this pivotal shift:

➤ **Augmented Energy Efficiency**

Diminished Carbon Footprint: The pivot to PoS precipitates a substantial reduction in the blockchain's energy requisites. Contrary to PoW, which mandates significant computational exertion for the mining process, PoS accomplishes transaction validation and block generation devoid of reliance on prodigious energy consumption. This strategic realignment underscores our allegiance to sustainability and environmental custodianship.

Operational Cost Efficiency: The decrease in energy consumption directly correlates with reduced operational expenditures, potentially amplifying the value proposition for our users and stakeholders.

➤ **Scalability and Performance Enhancements**

Accelerated Transaction Throughput: PoS facilitates expedited transaction validation, a critical factor in obviating bottlenecks and efficiently scaling our network to accommodate escalating activity and future growth trajectories.

Innovation and Technological Integration Capacity: The operational efficiencies engendered by PoS furnish a robust platform for the seamless incorporation of innovative functionalities, the adoption of avant-garde technologies, and the agile adaptation to the dynamic exigencies of the blockchain ecosystem.

➤ **Fortified Security Model**

Validator Incentive Alignment: The PoS framework intrinsically incentivizes validators to uphold network integrity, given the direct jeopardy to their staked QIE tokens in the event of malevolent conduct. This mechanism fosters a network that is inherently more secure and resilient.

Decentralization and Equitability: PoS mitigates the centralization risks endemic to PoW, where the agglomeration of mining power could potentially compromise the network's decentralization ethos. PoS promulgates a more democratized and equitable paradigm for blockchain security maintenance.

➤ **Amplified Community Engagement**

Stakeholder Empowerment through Staking: PoS confers upon QIE token holders the capacity to directly contribute to network security via staking, thereby enabling them to accrue rewards whilst reinforcing the blockchain's foundational stability.

➤ **Future-Proofing the Ecosystem**

Strategic Adaptability: The adoption of PoS positions QI Blockchain at the cutting edge of blockchain innovation, ensuring our ecosystem's resilience and adaptability amidst the rapidly evolving digital landscape.

Sustainability and Longevity: By prioritizing energy efficiency, scalability, security, and community engagement, we are architecting a blockchain ecosystem that not only caters to the immediate requisites of our user base but is also strategically poised to anticipate and adeptly navigate the multifaceted challenges and opportunities on the horizon.

2.2.4 Migration Process

We recently celebrated a pivotal advancement in blockchain technology with the seamless transition to Qie Blockchain Version 2.0. This evolution signifies our strategic pivot from the traditional Proof of Work (PoW) consensus mechanism to a more efficient and scalable Proof of Stake (PoS) framework.

Comprehensive Data Snapshot and Secure Transfer Protocol

The migration initiative commenced at block height 3529960, where a detailed snapshot of the Qie Blockchain V1 was captured. This snapshot included an exhaustive dataset encompassing user asset balances, deployed smart contracts, and other pertinent blockchain entries. The migration phase, spanning approximately 24 to 48 hours, was characterized by the precise and secure transfer of these datasets to the newly established PoS-based blockchain infrastructure.

Data Integrity Measures and User Guidance

Throughout the migration window, we advised our user base against initiating any new deposits or withdrawals to ensure the integrity and consistency of the data being transferred. It was crucial to maintain the fidelity of the migration process, highlighting that any transactions executed on the Qie Blockchain V1 subsequent to the snapshot block would not be mirrored on the V2 ledger.

In our pursuit of utmost transparency, we disseminated a comprehensive list of asset holders derived from the snapshot. This initiative was aimed at enabling users to independently verify their asset holdings, thereby reinforcing the credibility and accuracy of the migration endeavor.

Wallet Configuration and Network Transition

For users employing MetaMask or analogous cryptocurrency wallets, transitioning to the new blockchain necessitated an update to the wallet's Remote Procedure Call (RPC) settings, coupled with an adjustment in the Chain ID to correspond with the QIE network's new parameters. These modifications facilitated uninterrupted access to assets on the upgraded chain, with the enhanced blockchain explorer on QI Blockchain V2 offering a transparent and user-friendly interface for tracking transactions and holdings.

This meticulous approach to the migration process highlights our commitment to leveraging cutting-edge blockchain technology to enhance scalability, security, and user experience, marking a significant milestone in the continuous evolution of the QI Blockchain ecosystem.

2.3 Network Protocol

The QI Blockchain architecture is underpinned by a sophisticated amalgamation of network protocols, each chosen for its unique capabilities to enhance the platform's efficiency, security, and scalability. By integrating gRPC, libp2p, and JSON-RPC, the QI Blockchain not only ensures robust communication across its decentralized network but also sets a benchmark for interoperability and developer engagement in the blockchain domain.

gRPC: Enhancing Communication with High-Performance RPC

gRPC is a modern, open-source, high-performance Remote Procedure Call (RPC) framework that fundamentally transforms the way nodes and services communicate within the QI Blockchain. Built atop the advanced features of HTTP/2, gRPC facilitates multiplexed streams over a single connection, enabling simultaneous bidirectional communication. This capability significantly reduces latency and increases throughput, making gRPC an ideal protocol for the

demanding environment of blockchain operations. Moreover, gRPC's support for protocol buffers (Protobuf) as its interface description language offers superior serialization, ensuring efficient, strongly-typed communication. This protocol is pivotal in streamlining interactions across the QI Blockchain, from executing smart contracts to querying network states, thereby bolstering the network's performance and reliability.

libp2p: Fostering a Resilient Decentralized Network

At the heart of the QI Blockchain's decentralized networking capabilities lies libp2p, a modular and extensible network stack that abstracts the complexities inherent in peer-to-peer communications. libp2p's architecture is designed to overcome the challenges of network dynamics, such as peer discovery, content routing, encryption, and NAT traversal, ensuring seamless connectivity across the blockchain's distributed landscape. By decoupling the network protocol from the application logic, libp2p provides the QI Blockchain with the flexibility to adapt to various networking conditions and configurations. This adaptability is crucial for maintaining a resilient and scalable network that can efficiently handle the ever-growing demands of blockchain applications and services.

JSON-RPC: Streamlining Developer Interaction with a Standardized API

JSON-RPC serves as the interface for executing remote procedure calls within the QI Blockchain, offering developers a straightforward and interoperable method to interact with the blockchain's core functionalities. Utilizing JSON as its data format, JSON-RPC provides a lightweight, human-readable, and language-agnostic protocol that simplifies the development of decentralized applications (DApps). Whether it's deploying smart contracts, querying transaction histories, or managing accounts, JSON-RPC's request-response model facilitates a wide range of operations with minimal overhead. This accessibility is instrumental in lowering the barrier to entry for developers, encouraging innovation and the proliferation of DApps on the QI Blockchain ecosystem.

The strategic integration of gRPC, libp2p, and JSON-RPC into the QI Blockchain's design exemplifies the platform's commitment to leveraging cutting-edge technologies to enhance network efficiency, security, and developer experience. These protocols collectively empower the QI Blockchain to deliver a robust, scalable, and user-friendly platform, paving the way for the next generation of blockchain innovation.

2.4 Block Rewards on the QI Blockchain

In the realm of blockchain technology, the concept of block rewards plays a pivotal role in incentivizing participants, particularly validators or miners, to contribute their computational resources towards the maintenance and security of the network. Within the QI Blockchain ecosystem, this incentive mechanism is meticulously designed to ensure the sustainability and robustness of the network's operations.

The QI Blockchain has instituted a block reward system that allocates **0.5 QIE coins for every block** validated and added to the blockchain. This reward serves as a direct incentive for validators participating in the Proof of Stake (PoS) consensus mechanism, encouraging them to act in the network's best interest.

Technical Insights into QI Block Rewards

➤ **Incentive Alignment**

The allocation of 0.5 QIE per block is strategically set to balance the network's economic model, ensuring validators are adequately compensated for their efforts in securing the network while also controlling the inflation rate of QIE coins.

➤ **Consensus Mechanism Synergy**

Operating on a PoS consensus mechanism, the QI Blockchain leverages block rewards as a means to encourage stakeholder participation. Validators are selected to create new blocks based on the amount of QI they hold and are willing to "stake" or lock up as collateral, making the reward system integral to the network's security and integrity.

➤ **Sustainability and Network Growth**

The block reward system is designed with a long-term perspective, aiming to sustain validator participation and network growth over time. By providing consistent rewards, the QI Blockchain ensures that it remains attractive for existing validators and new participants, thereby enhancing the network's decentralization and resilience.

➤ **Adjustment Mechanisms**

While the initial reward is set at 0.5 QIE per block, the QI Blockchain may incorporate mechanisms for adjusting this reward based on various factors such as token supply, network usage, and economic conditions. This flexibility ensures that the block reward system remains effective and sustainable throughout the lifecycle of the blockchain.

The block reward of 0.5 QI per block is a critical component of the QI Blockchain's economic and security model. By incentivizing validators through these rewards, the QI Blockchain not only secures its network and processes transactions efficiently but also fosters a vibrant ecosystem where participants are motivated to contribute to the network's longevity and success.

2.5 Block time on the QI Blockchain

Block time, in the context of blockchain technology, refers to the duration required to generate or mine a new block in the blockchain network. For the QI Blockchain, this interval is meticulously configured to five seconds per block. This parameter is a critical aspect of the blockchain's design, influencing its transaction throughput, security, and overall network efficiency.

Technical Examination of QI Blockchain's Block Time

➤ **Optimized Transaction Throughput**

Setting the block time at five seconds per block significantly enhances the QI Blockchain's ability to process transactions swiftly. This rapid block generation rate allows for higher transaction throughput, reducing latency and improving the user experience by facilitating quicker transaction confirmations.

➤ **Network Scalability and Efficiency**

A shorter block time, such as the five-second interval employed by the QI Blockchain, is instrumental in achieving greater network scalability. It enables the network to accommodate a larger volume of transactions, thereby supporting increased user activity without compromising performance.

➤ **Consensus Mechanism Integration**

The five-second block time is closely tied to the blockchain's underlying Proof of Stake (PoS) consensus mechanism. This expedited block generation process is made possible by the efficiency of PoS, which does not require the extensive computational work characteristic of Proof of Work (PoW) systems. As a result, the QI Blockchain can maintain its swift block time while ensuring network security and validator participation.

➤ **Balancing Security and Performance**

The determination of block time is a delicate balance between enhancing transaction speed and ensuring network security. A shorter block time, while beneficial for transaction processing speed, necessitates a robust consensus mechanism and network infrastructure to prevent security vulnerabilities, such as double-spending attacks or fork resolutions. The QI Blockchain's five-second block time reflects a strategic optimization, ensuring rapid transaction processing without compromising the network's integrity.

➤ **Impact on Decentralization**

The choice of block time also has implications for the blockchain's decentralization. A shorter block time can lead to a higher rate of orphaned blocks, which, if not properly managed, might centralize mining power or validation authority. The QI Blockchain addresses this through its PoS consensus, which inherently reduces the likelihood of such centralization by distributing validation power among a broader set of stakeholders.

This approach underscores the blockchain's commitment to providing a responsive and efficient platform for its users and developers.

2.6 Scalability Solutions

To tackle the paramount challenges of scalability, ensuring minimal transaction fees, and optimizing settlement times within its ecosystem, the QI Blockchain harnesses advanced methodologies, prominently featuring sharding. This technique is a cornerstone in the QI

Blockchain's strategy to redefine data handling and processing, propelling the network towards unparalleled performance and efficiency.

Sharding to boost QI Blockchain's Scalability

Sharding is a sophisticated partitioning strategy that segments the QI Blockchain's data into smaller, manageable units known as "shards." Each shard possesses the capability to independently process transactions, enabling parallel processing and significantly augmenting the network's capacity and transaction throughput. This strategic distribution of workload allows the QI Blockchain to efficiently manage a higher volume of transactions concurrently, mitigating network congestion and subsequently reducing transaction fees.

Technical Facets of Sharding in the QI Blockchain

➤ State Sharding

This technique involves segregating the blockchain's state into distinct shards, with each maintaining its unique state and transaction history. State sharding empowers the QI Blockchain to parallelly process an extensive number of transactions, significantly bolstering scalability and operational efficiency.

➤ Network Sharding

Network sharding divides the blockchain's nodes into smaller consensus groups, each tasked with validating transactions within a specific shard. This division minimizes the communication overhead and computational load on individual nodes, thereby accelerating the consensus process and block validation.

➤ Transactional Sharding

Focusing on the strategic distribution of transactions across various shards based on predefined criteria, such as the transaction's origin or involved addresses, transactional sharding ensures swift and efficient transaction processing. This contributes to reduced settlement times across the network.

Impact on Transaction Fees and Settlement Times

The implementation of sharding within the QI Blockchain directly influences the network's transaction fees and settlement times through:

➤ Increased Throughput

Sharding facilitates parallel transaction processing, markedly enhancing the network's throughput. This efficiency alleviates network congestion, a key contributor to elevated transaction fees, thus ensuring lower fees even during periods of high transaction volume.

➤ Optimized Resource Utilization

By optimizing the allocation of computational power and storage capacity across nodes, sharding reduces the operational expenses of the network. This optimization is reflected in lower transaction fees, benefiting users of the QI Blockchain.

➤ **Enhanced Block Propagation and Confirmation**

Sharding enables faster propagation and confirmation of blocks within each shard, leading to quicker settlement times. This efficiency is achieved as each shard handles only a fraction of the total data, allowing for rapid consensus and block finalization.

Sharding stands as a pivotal innovation in the QI Blockchain's quest for enhanced scalability, directly tackling the inherent limitations of transaction processing capacity, fees, and settlement times. By segmenting the blockchain into more manageable shards, the QI Blockchain achieves significant performance enhancements, ensuring scalability as the network expands.

2.7 Security Measures of QI Blockchain

The QI Blockchain employs a multifaceted security strategy to safeguard its network and users against potential threats, including the notorious 51% attacks, and to ensure the integrity and security of smart contracts deployed on its platform. These measures are critical in maintaining trust and reliability within the blockchain ecosystem.

Preventing 51% Attacks

A 51% attack occurs when a single entity or group gains control of more than half of the network's mining hash rate or staking capacity, enabling them to manipulate transaction confirmations and, potentially, to double-spend coins. The QI Blockchain implements several robust mechanisms to mitigate the risk of such attacks:

➤ **Decentralized Node Architecture**

By encouraging a wide distribution of nodes across its network, the QI Blockchain reduces the likelihood of any single entity gaining majority control. This decentralization is fundamental to preventing 51% attacks.

➤ **Enhanced Consensus Mechanism**

The QI Blockchain may utilize an advanced Proof of Stake (PoS) or a variant consensus mechanism that inherently discourages 51% attacks by making it economically unfeasible for attackers to acquire the majority stake.

➤ **Network Monitoring and Anomaly Detection**

Continuous monitoring of network activity allows for the early detection of unusual patterns that may indicate an attempt at a 51% attack. Automated systems can trigger alerts and initiate protective protocols to counteract suspicious activities.

➤ **Penalty Systems**

Implementing penalty systems for malicious activities, such as slashing the stakes of validators who attempt to undermine the network's security, serves as a deterrent

against 51% attacks.

Smart Contract Security

Smart contracts are self-executing contracts with the terms of the agreement directly written into code. While they offer significant advantages in terms of automating and enforcing agreements, they also present unique security challenges. The QI Blockchain addresses these through:

- **Formal Verification**
This mathematical approach ensures that smart contracts behave as intended by verifying the correctness of the contract's code against its specifications. Formal verification can significantly reduce the risk of bugs and vulnerabilities.
- **Security Audits and Bug Bounties**
Regular, comprehensive security audits conducted by independent experts help identify and rectify vulnerabilities in smart contract code. Additionally, bug bounty programs incentivize the community to discover and report security flaws.
- **Smart Contract Development Frameworks**
The use of established smart contract development frameworks that include security best practices and pre-built, audited code libraries helps prevent common vulnerabilities.
- **Time locks and Upgradeability**
Implementing time locks for critical operations and enabling the upgradeability of smart contracts allows for the correction of vulnerabilities in deployed contracts and the adaptation to emerging security threats.

Through a combination of technological innovations, community engagement, and continuous vigilance, the QI Blockchain aims to provide a secure, reliable platform for decentralized applications and transactions.

2.8 How does QI Blockchain Benefit Developers?

The QI Blockchain offers a suite of developer-friendly tools and resources designed to facilitate the creation, deployment, and management of decentralized applications (DApps) and smart contracts. Below is a list of key developer tools and resources provided by the QI Blockchain, along with their importance for developers:

Proof of Stake (PoS) Consensus Mechanism

- **Importance:** The PoS mechanism is central to the QI Blockchain architecture, offering a more energy-efficient alternative to Proof of Work (PoW). For developers, this means access to a network that is not only faster and more scalable but also more cost-

effective to participate in as validators or DApp creators.

Dynamic Staking and Validator Incentives

- **Importance:** This feature encourages a robust participation model by allowing developers to become validators. The dynamic staking mechanism adjusts rewards based on network growth and security needs, providing a direct incentive for developers to contribute to network integrity and performance.

Resilience via Decentralized Network Design

- **Importance:** A decentralized architecture ensures that applications built on the QI Blockchain are resilient to attacks and failures. For developers, this means their applications can benefit from higher uptime and reliability, essential for user trust and adoption.

Accelerated Processing with High-Performance Computing

- **Importance:** The provision of high-performance computing resources for validator nodes ensures that developers can rely on the network to process transactions and smart contracts quickly and efficiently, crucial for applications requiring high throughput and low latency.

Strategic Node Distribution

- **Importance:** By dispersing nodes geographically, the QI Blockchain minimizes latency and enhances the user experience for DApps. This global distribution also contributes to the network's fault tolerance, ensuring that applications remain operational even in the event of localized disruptions.

Scalability Solutions through Sharding

- **Importance:** Sharding addresses scalability by dividing the blockchain into smaller, manageable segments, allowing for parallel processing. For developers, sharding means their applications can scale more effectively as the network grows, without compromising on speed or increasing transaction fees.

Smart Contract Security Measures

- **Importance:** The QI Blockchain's focus on smart contract security, through formal verification, security audits, and bug bounties, provides developers with a framework to build secure and reliable applications. This reduces the risk of vulnerabilities and exploits, protecting both developers and users.

Comprehensive API and RPC Support

- **Importance:** Comprehensive API documentation and RPC API support are invaluable for developers integrating their applications with the QI Blockchain. These resources provide the necessary technical details and endpoints for seamless interaction with the blockchain, facilitating everything from transaction processing to smart contract

deployment.

Developer Guides and Tutorials

- **Importance:** Guides and tutorials specific to the QI Blockchain ecosystem equip developers with the knowledge and skills to effectively utilize the platform's features. These educational resources are crucial for onboarding new developers and supporting the development of innovative DApps and services.

By providing a secure, scalable, and efficient platform, along with comprehensive support and documentation, the QI Blockchain empowers developers to create decentralized applications that can transform industries and drive the adoption of blockchain technology.

2.9 Building and Deploying a QI Blockchain Full Node

2.9.1 Run a QI Blockchain full node

This comprehensive guide is designed to facilitate developers and enthusiasts in establishing and operating a full node on the QI Blockchain. By engaging directly with the QI network through a dedicated node, participants can gain firsthand experience and deeper insights into the network's functionality. Below, we outline the steps to install, run, and connect a QI node to the blockchain network.

The quickest way to learn about QI is to run a node and interact with the network. In this tutorial, we will:

- Installation and Execution of a QI Node
- Establishing Connection to the QI Blockchain

Prerequisites

Before embarking on this journey, ensure your setup meets the following requirements:

Computer Hardware and Operating System

The QI protocol is designed to be efficient, allowing full nodes to run on standard hardware configurations. However, as network activity increases, these requirements may evolve.

- **PU:** Minimum of 6 AWS vCPU or equivalent processing power.
- **RAM:** 8 GiB for optimal performance.
- **Storage:** At least 250 GB of available space.
- **Operating System:** Ubuntu 18.04 or 20.04 is recommended for stability and compatibility.

Networking

To run successfully, QI needs to accept connections from the Internet on the network port 5656 for mainnet. You must decide the networking environment your node will operate in before you start the installation.

Running on a Cloud Provider

Your node will have a static IP if it is operating on a cloud provider's computer instance. Find out what that static IP is, or if you haven't already, configure it.

Running on a Home Connection

You have a dynamic IP, which means that it will change from time to time if you are running a node on a computer connected to a residential internet connection. In order to access the computer, the node is installed on from the Internet, you must configure inbound port forwarding of port 5656.

Getting Started

Step 1

Prepare Your Environment

Verify that your system meets the specified hardware and software requirements.

Step2

Network Configuration

Choose your deployment environment (cloud or home network) and set up your network accordingly to ensure your node is reachable on port 5656.

Step 3

Install the QI Node

Follow the detailed installation instructions specific to your operating system. This process involves downloading the QI node software and configuring it to start automatically.

Step 4

Synchronize Your Node

Upon launching, your node will begin to synchronize with the QI blockchain, downloading a complete copy of the ledger. This process can take some time, depending on your internet speed and the current size of the blockchain.

Step 5

Connect to the Network

Once synchronized, your node is now an active participant in the QI network, capable of validating transactions and blocks.

By completing these steps, you contribute to the decentralization and robustness of the QI network, while also gaining valuable experience in blockchain technology operations.

2.9.1.1 Starting a Full Node

Welcome to the comprehensive setup manual for initiating a QI Blockchain node. This guide is designed to navigate you through the process of establishing a fully operational node on the QI Blockchain. Technical proficiency is not a prerequisite, but adherence to the outlined steps is crucial.

Initial Setup and Configuration

Step 1: Accessing the Command Line Interface (CLI)

Windows Users: Locate "CMD" or "Command Prompt" via the start menu and initiate it.

macOS/Linux Users: Search for "Terminal" in your applications and open it.

Step 2: Git Installation

Install Git Before we can clone the QI Blockchain binaries, we need to ensure that Git is installed on your machine. Run this command to install Git: bash Copy code `sudo apt-get install git -y`

Step 3: System Package Update

Update Your Package List It's always a good idea to have the latest updates before installing something new. Run the command below to update your system's package list: bash Copy code `sudo apt-get update`

Step 4: Cloning QI Blockchain Binaries

Clone the QI Blockchain Binaries Now, we're going to download (or "clone") the QI Blockchain binaries from GitHub. Execute the following command: bash Copy code `git clone https://github.com/QIBlockchain/qi-blockchain-binaries`

Step 5: Directory Navigation

Enter the Cloned Directory After cloning, we need to go into the directory that was just created. Change directory by running: bash Copy code `cd qi-blockchain-binaries`

Step 6: Initializing Blockchain Secrets

Initialize QI Blockchain Secrets We need to set up some secrets for our node to operate securely. Initialize the secrets with this command: bash Copy code `./qichain secrets init -data-dir test-chain-1`

Step 7: Launching the QI Blockchain Node

Start Your QI Blockchain Node It's time to start your node and connect it to the QI Blockchain.

Step 8: Genesis File Creation

Run this command to create new file `nano genesis.json`

Step 9: Acquiring the Genesis File

Copy the mainnet genesis file from the link in left hand navigation bar or click on <https://docs.qiblockchain.online/build-and-api/run-a-qi-blockchain-full-node/genesis-file>

Use this command to run your node: `bash`

Copy code: `/qichain server --data-dir ./test-chain-1 --chain genesis.json --grpc-address :10000 --libp2p 172.16.0.228:10001 --jsonrpc 172.16.0.228:10002 --seal --block-time 5`

Step 8: Node Operation Verification

Confirm Your Node is Running If everything went well, your node should now be running. You won't get a specific "success" message, but if you don't see any error messages, that means it's working!

Troubleshooting: If you encounter errors during any step, carefully read the error message. It often provides hints on what went wrong. If you're stuck, don't hesitate to search online for the error message or ask for help in forums. Congratulations! You've just set up your QI Blockchain node. By following these steps, you've contributed another valuable node to the network. Thank you for participating!

2.9.1.2 Genesis File

You need to utilize following genesis file for [setup](#) QI Blockchain Node

Mainnet Genesis file (.json format)

You can also download the mainnet genesis file from here

[genesis.json.docx](#)

2.9.2 How to become a Validator on the New QI Blockchain?

The advent of the new QI Blockchain heralds a transformative opportunity for community members to engage deeply with the network's governance mechanisms and to accrue substantial rewards. This guide delineates the pathway to becoming a validator, elucidating the potential rewards and the pivotal role you will play in the ecosystem.

1. Validator Setup Process

Initiating a Full Node: To become a validator, you first need to set up a full node on the new QI Blockchain network. This node will be responsible for validating transactions and maintaining the integrity of the blockchain.

Minimum Staking Requirement: Once your node is set up, you must stake a minimum of 50,000 QIE to qualify as a validator. This staking serves as a security deposit, ensuring validators have a vested interest in the proper functioning of the network.

2. Reward Mechanisms for Validators

Transaction Fee Rewards: As a validator, you will receive rewards in the form of transaction fees. These fees are a direct incentive for participating in the validation process.

Additional Staking Rewards: Beyond transaction fees, validators stand to gain additional rewards proportional to their staked amount. These incentives are sourced from a specially designated smart contract, which is endowed with 100 million QIE and operates without ownership functionalities.

Claiming Rewards: Validators are entitled to claim their rewards following every 259,200 blocks, as facilitated by the deployed smart contract. This system ensures a consistent and equitable distribution of rewards among active validators.

3. Reward Halving Schedule:

Halving Mechanism: To guarantee a sustainable reward ecosystem for validators, the staking pool rewards undergo a halving every two years, automatically executed by the smart contract. This strategy is aimed at preserving the long-term viability of the reward structure.

4. Block Time and Rewards

Accelerated Block Time: The QI Blockchain boasts a swift block time of 5 seconds, significantly enhancing the speed of transaction validations.

Block Reward Scheme: Validators are poised to earn rewards of approximately 0.5 QIE per block, a rate meticulously calibrated to foster network participation and ensure its ongoing vitality.

5. Proportional Reward Distribution:

The more QIE you stake as a validator, the larger your share of the block rewards. This proportional reward system encourages larger stakes, thereby enhancing the overall security and robustness of the blockchain.

2.9.2.1 Steps for Validator Setup

Understanding the Validator Role

Step 1: Grasp the Validator's Responsibilities

Validators are pivotal to the blockchain ecosystem, tasked with verifying transactions and forging new blocks. Their role is critical in upholding the network's security and operational integrity.

Preparing Your Setup

Step 2: Assess Hardware and Internet Connectivity

- **Hardware Requirements:** Ensure your setup includes a modern processor, at least 8GB of RAM, and over 500GB of storage for the blockchain data.
- **Internet Connection:** A stable, fast internet connection with 99% uptime is crucial to maintain your validator's effectiveness and avoid penalties.

Setting Up Your QI Blockchain Node

Step 3: Open Your Terminal or Command Prompt Windows Users: Search for "CMD" or "Command Prompt" in your start menu and open it. macOS/Linux Users: Search for "Terminal" in your applications and open it.

Step 4: Install Git

Install Git with the command: `sudo apt-get install git -y`. This tool is required to clone the QI Blockchain binaries.

Step 5: Update Your Package List

Keep your system updated by running: `sudo apt-get update`.

Step 6: Clone the QI Blockchain Binaries

Download the necessary files with: `git clone https://github.com/QIBlockchain/qi-blockchain-binaries`.

Step 7: Change to the Cloned Directory

Access the downloaded files by typing: `cd qi-blockchain-binaries`.

Step 8: Initialize Blockchain Secrets

Set up your node's security with: `./qichain secrets init --data-dir test-chain-1`

Step 9: Start Your Node

Connect and run your node using: `./qichain server --data-dir ./test-chain-1 --chain genesis.json --grpc-address :10000 --libp2p 172.16.0.228:10001 --jsonrpc 172.16.0.228:10002 --seal --block-time`

Step 10: Verify Node Operation

Ensure your node is running smoothly without errors. Successful operation is indicated by the absence of error messages in the terminal.

Step 11: Wallet Setup and Token Acquisition

Set up your QI Blockchain wallet if you haven't already and acquire a minimum of 50,000 QIE tokens, typically through a cryptocurrency exchange.

Step 12: Stake Your QIE Tokens

Utilize the staking interface within your node or wallet to lock in at least 50,000 QIE tokens, meeting the minimum requirement to qualify as a validator.

2.9.2.2 Validator Registration and Activation

Navigate to the Validator Registration Website

Access the official validator portal at <https://validator.qiblockchain.online/> to initiate the registration and staking process. This is the official platform where you can register and manage your validator node.

Initiate the Staking Process Click on "Stake"

On the website, look for the "Stake" button and click on it. This action will take you to the page where you can begin the registration and staking process for your node.

Provide Node Information Enter Your Node's RPC URL

You'll need to enter the RPC (Remote Procedure Call) URL of your node. The RPC URL is how the staking platform communicates with your node, so ensure its entered correctly.

Enter Your Node's Public Key

Your node's public key is required for identification and security purposes. Make sure to enter it accurately.

Complete the Staking Enter Your Node's Private Key

Carefully enter your node's private key. This key is crucial for signing transactions and must be kept secure at all times.

Provide the RPC URL Again

Re-enter your node's RPC URL for confirmation. Specify the Stake Amount: Decide on the amount of QIE you wish to stake. Remember, you need to stake a minimum of 50,000 QIE to qualify as a validator.

Finalize Staking

After double-checking all the information you've entered, click on the "Stake" button again to submit your stake and complete the registration process.

Wait for Activation Process

Once you've submitted your stake, there might be a waiting period for your node to be approved and activated as a validator. The specific details of this process can vary, so refer to any guidance provided on the QI Blockchain validator portal or official documentation.

Becoming a validator on the QI Blockchain is a commitment that demands technical know-how, a secure and robust hardware setup, and a strategic stake in the network's tokens. By following this comprehensive guide, you're not just setting up a node; you're stepping into a vital role that enhances the blockchain's functionality and trustworthiness. Your contribution as a validator is invaluable to the QI Blockchain's ecosystem, driving its success and decentralization.

2.10 QI Blockchain CLI Parameters

This reference describes the syntax of the QI Blockchain Command Line Interface (CLI) options.

Specifying options

Command line: Directly when running the QI client.

General Options

Block Gas Target (`--block-gas-target`)

Syntax: `--block-gas-target=<STRING>`

Sets the target block gas limit. Defaults to the parent block's value if omitted.

Block Time (--block-time)

Syntax: `--block-time=<INTEGER>sec`

Sets the minimum block time in seconds. Must be at least 1s. Default is 2 seconds.

Chain (--chain)

Syntax: `--chain=<STRING>`

Specifies the genesis file for starting the chain. Default is `./genesis.json`.

Config File (--config)

Syntax: `--config=<STRING>`

Path to the CLI configuration file. Supports JSON and HCL formats.

Data Directory (--data-dir)

Syntax: `--data-dir=<STRING>`

Directory for storing QI client data.

GRPC Address (--grpc-address)

Syntax: `--grpc-address=<STRING>`

GRPC interface address. Default is `127.0.0.1:9632`.

JSON RPC Interface (--jsonrpc)

Syntax: `--jsonrpc=<STRING>`

JSON-RPC interface address. Default is `0.0.0.0:8545`.

Libp2p (--libp2p)

Syntax: `--libp2p=<STRING>`

Address and port for the libp2p service. Default is `127.0.0.1:1478`.

Log Level (--log-level)

Syntax: `--log-level=<STRING>`

Console output log level. Default is `INFO`.

Log to File (--log-to)

Syntax: `--log-to=<STRING>`

Specifies a file location to write all logs instead of the console.

Networking and Peering Options

Max Inbound Peers (--max-inbound-peers)

Syntax: `--max-inbound-peers=<INTEGER>`

Maximum number of inbound peers. Default is 32.

Max Outbound Peers (--max-outbound-peers)

Syntax: --max-outbound-peers=<INTEGER>

Maximum number of outbound peers. Default is 8.

Max Peers (--max-peers)

Syntax: --max-peers=<INTEGER>

Maximum number of peers allowed. Default is 40.

Miscellaneous Options

No Discover (--no-discover)

Disables peer discovery.

Prometheus (--prometheus)

Syntax: --prometheus=<STRING>

Address and port for Prometheus instrumentation service. If only a port is defined (:port), it binds to 0.0.0.0:port.

Relayer (--relayer)

Starts the state sync relayer service (PolyBFT only).

Restore (--restore)

Syntax: --restore=<STRING>

Path to archive blockchain data for initialization.

Smart Contract Addresses

QIDEX: 0x079Acabcc1fcd9E7211a0Bc294aee02EEfCe77e3

QIDexFactory: 0xadfB415e03dB95f92041096A1e4aa6B80f42178c

WQIE: 0x3aF492C875829B69a0803f4688C54fb867C193DF

QIDexRouter : 0x1a556530bb46c8eC4cdf8c750925952CF89d8E90

QI USD: 0xb7bAdd6361Ba17d60FF2dedDdd18be132aA2c421

MARKETPLACE ADDRESS: 0x7696B22Fe8cd809CccEc17237D3434277a13bd8D

NEW NFT ADDRESS: 0x0DD226795Bd9542a1b064C150EB2AF01b602aee5

MLM CONTRACT ADDRESS: 0x2C5aF4aa2bC321b7Efb9752f1A32392aa3fcDe3

PAWSOME : 0x85e09BE9b26d9ad7Ef8AbE84291B800BB

2.11 API Documentation and Developer Resources

2.11.1 API Documentation

Base URL: <https://mainnet.qiblockchain.online/api>

This API is provided for developers transitioning their applications on QI. It supports GET and POST requests.

```
Account?module=account  
Logs?module=logs  
Token?module=token  
Stats?module=stats  
Block?module=block  
Contract?module=contract
```

<https://nodevalidator.qiblockchain.online/qisupply> - For getting the current supply of QIE

<https://nodevalidator.qiblockchain.online/qiDexSupply> - For getting the current supply of QIDEX tokens

2.11.2 RPC API

Note :

All JSON-RPC HTTP examples use the default host and port endpoint

<http://127.0.0.1:10002>. If using the `–rpc-http-host` or `–rpc-http-port` options, update the endpoint.

Download collection

Alternatively, you can download the JSON collection file.

[qie_web3.json](#)

[qie_txpool.json](#)

[qie_net.json](#)

[qie_apis.json](#)

2.11.2.2 QIE methods

eth_chainId

Returns the currently configured chain id, a value used in replay-protected transaction signing as introduced by EIP-155.

Parameters

None

Returns

QUANTITY - big integer of the current chain id.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_chainId","params":[],"id":1}'
```

eth_syncing

Returns information about the sync status of the node

Parameters

None

Returns

* Boolean (FALSE) - if the node isn't syncing (which means it has fully synced)

* Object - an object with sync status data if the node is syncing

startingBlock: QUANTITY - The block at which the import started (will only be reset, after the sync reached his head)

currentBlock: QUANTITY - The current block, same as eth_blockNumber

highestBlock: QUANTITY - The estimated highest block

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_syncing","params":[],"id":1}'
```

eth_getBlockByNumber

Returns block information by number.

Parameters

QUANTITY|TAG - integer of a block number, or the string "latest"

Boolean - If true it returns the full transaction objects, if false only the hashes of the transactions.

Returns

Object - A block object, or null when no block was found:

number: QUANTITY - the block number.

hash: DATA, 32 Bytes - hash of the block.

parentHash: DATA, 32 Bytes - hash of the parent block.

nonce: DATA, 8 Bytes - hash of the generated proof-of-work.

sha3Uncles: DATA, 32 Bytes - SHA3 of the uncles data in the block.

logsBloom: DATA, 256 Bytes - the bloom filter for the logs of the block.

transactionsRoot: DATA, 32 Bytes - the root of the transaction trie of the block.

stateRoot: DATA, 32 Bytes - the root of the final state trie of the block.

receiptsRoot: DATA, 32 Bytes - the root of the receipts trie of the block.

miner: DATA, 20 Bytes - the address of the beneficiary to whom the mining rewards were given.

difficulty: QUANTITY - integer of the difficulty for this block.

totalDifficulty: QUANTITY - integer of the total difficulty of the chain until this block.

extraData: DATA - the "extra data" field of this block.

size: QUANTITY - integer the size of this block in bytes.

gasLimit: QUANTITY - the maximum gas allowed in this block.

gasUsed: QUANTITY - the total used gas by all transactions in this block.

timestamp: QUANTITY - the unix timestamp for when the block was collated.

transactions: Array - Array of transaction objects, or 32 Bytes transaction hashes depending on the last given parameter.

uncles: Array - Array of uncle hashes.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getBlockByNumber","params":["latest", true], "id":1}'
```

eth_getBlockByHash

Returns block information by hash.

Parameters

DATA , 32 Bytes - Hash of a block.

Boolean - If true it returns the full transaction objects, if false only the hashes of the transactions.

Returns

Object - A block object, or null when no block was found:

number: QUANTITY - the block number.

hash: DATA, 32 Bytes - hash of the block.

parentHash: DATA, 32 Bytes - hash of the parent block.

nonce: DATA, 8 Bytes - hash of the generated proof-of-work.

sha3Uncles: DATA, 32 Bytes - SHA3 of the uncles data in the block.

logsBloom: DATA, 256 Bytes - the bloom filter for the logs of the block.

transactionsRoot: DATA, 32 Bytes - the root of the transaction trie of the block.

stateRoot: DATA, 32 Bytes - the root of the final state trie of the block.

receiptsRoot: DATA, 32 Bytes - the root of the receipts trie of the block.

miner: DATA, 20 Bytes - the address of the beneficiary to whom the mining rewards were given.

difficulty: QUANTITY - integer of the difficulty for this block.

totalDifficulty: QUANTITY - integer of the total difficulty of the chain until this block.

extraData: DATA - the "extra data" field of this block.

size: QUANTITY - integer the size of this block in bytes.

gasLimit: QUANTITY - the maximum gas allowed in this block.

gasUsed: QUANTITY - the total used gas by all transactions in this block.

timestamp: QUANTITY - the unix timestamp for when the block was collated.

transactions: Array - Array of transaction objects, or 32 Bytes transaction hashes depending on the last given parameter.

uncles: Array - Array of uncle hashes.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data
'{"jsonrpc":"2.0","method":"eth_getBlockByHash","params":["0xdc0818cf78f21a8e70579cb46a4
3643f78291264dda342ae31049421c82d21ae",false],"id":1}'
```

eth_blockNumber

Returns the number of the most recent block.

Parameters

None

Returns

QUANTITY - integer of the current block number the client is on.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data
'{"jsonrpc":"2.0","method":"eth_blockNumber","params":[],"id":1}'
```

eth_gasPrice

Returns the current price of gas in wei. If minimum gas price is enforced by setting the `--price-limit` flag, this endpoint will return the value defined by this flag as minimum gas price.

Parameters

None

Returns

QUANTITY - integer of the current gas price in wei.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data
'{"jsonrpc":"2.0","method":"eth_gasPrice","params":[],"id":1}'
```

eth_getBalance

Returns the balance of the account of the given address.

Parameters

DATA, 20 Bytes - address to check for balance.

QUANTITY|TAG - integer block number, or the string "latest"

Returns

QUANTITY - integer of the current balance in wei.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getBalance","params":["0x407d73d8a49eeb85d32cf465507dd71d507100c1", "latest"],"id":1}'
```

eth_sendRawTransaction

Creates new message call transaction or a contract creation for signed transactions.

Parameters

DATA - The signed transaction data.

Returns

DATA, 32 Bytes - the transaction hash, or the zero hash if the transaction is not yet available.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_sendRawTransaction","params":["0xd46e8dd67c5d32be8d46e8dd67c5d32be8058bb8eb970870f072445675058bb8eb970870f072445675"],"id":1}'
```

eth_getTransactionByHash

Returns the information about a transaction requested by transaction hash.

Parameters

DATA, 32 Bytes - hash of a transaction

Returns

Object - A transaction object, or null when no transaction was found:

blockHash: DATA, 32 Bytes - hash of the block where this transaction was in.

blockNumber: QUANTITY - block number where this transaction was in.

from: DATA, 20 Bytes - address of the sender.

gas: QUANTITY - gas provided by the sender.
gasPrice: QUANTITY - gas price provided by the sender in Wei.
hash: DATA, 32 Bytes - hash of the transaction.
input: DATA - the data send along with the transaction.
nonce: QUANTITY - the number of transactions made by the sender prior to this one.
to: DATA, 20 Bytes - address of the receiver. null when its a contract creation transaction.
transactionIndex: QUANTITY - integer of the transactions index position in the block.
value: QUANTITY - value transferred in Wei.
v: QUANTITY - ECDSA recovery id
r: DATA, 32 Bytes - ECDSA signature r
s: DATA, 32 Bytes - ECDSA signature s

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getTransactionByHash","params":["0x88df016429689c079f3b2f6ad39fa052532c56795b733da78a91ebe6a713944b"],"id":1}'
```

eth_getTransactionReceipt

Returns the receipt of a transaction by transaction hash.

Note That the receipt is not available for pending transactions.

Parameters

DATA, 32 Bytes - hash of a transaction

Returns

Object - A transaction receipt object, or null when no receipt was found:

transactionHash : DATA, 32 Bytes - hash of the transaction.
transactionIndex: QUANTITY - integer of the transactions index position in the block.
blockHash: DATA, 32 Bytes - hash of the block where this transaction was in.
blockNumber: QUANTITY - block number where this transaction was in.
from: DATA, 20 Bytes - address of the sender.
to: DATA, 20 Bytes - address of the receiver. null when its a contract creation transaction.

cumulativeGasUsed : QUANTITY - The total amount of gas used when this transaction was executed in the block.

gasUsed : QUANTITY - The amount of gas used by this specific transaction alone.

contractAddress : DATA, 20 Bytes - The contract address created, if the transaction was a contract creation, otherwise null.

logs: Array - Array of log objects, which this transaction generated.

logsBloom: DATA, 256 Bytes - Bloom filter for light clients to quickly retrieve related logs.

It also returns either:

root: DATA 32 bytes - post-transaction stateroot (pre-Byzantium)

status: QUANTITY - either 1 (success) or 0 (failure)

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getTransactionReceipt","params":["0xb903239f8543d04b5dc1ba6579132b143087c68db1b2168786408fcbce568238"],"id":1}'
```

eth_getTransactionCount

Returns the number of transactions sent from an address.

Parameters

DATA, 20 Bytes - address.

QUANTITY|TAG - integer block number, or the string "latest"

Returns

QUANTITY - integer of the number of transactions send from this address.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getTransactionCount","params":["0x407d73d8a49eeb85d32cf465507dd71d507100c1","latest"],"id":1}'
```

eth_getBlockTransactionCountByNumber

Returns the number of transactions in a block matching the given block number.

Parameters

QUANTITY|TAG - integer of a block number, or the string "latest"

Returns

QUANTITY - integer of the number of transactions in this block.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getBlockTransactionCountByNumber","params":["latest"],"id":1}'
```

eth_getLogs

Returns an array of all logs matching a given filter object.

Parameters

Object - The filter options:

fromBlock: QUANTITY|TAG - (optional, default: "latest") Integer block number, or "latest" for the last mined block

toBlock: QUANTITY|TAG - (optional, default: "latest") Integer block number, or "latest" for the last mined block

address: DATA|Array, 20 Bytes - (optional) Contract address or a list of addresses from which logs should originate.

topics: Array of DATA - (optional) Array of 32 Bytes DATA topics. Topics are order-dependent. Each topic can also be an array of DATA with "or" options.

blockhash: DATA, 32 Bytes - (optional, future) With the addition of EIP-234, blockHash will be a new filter option which restricts the logs returned to the single block with the 32-byte hash blockHash. Using blockHash is equivalent to fromBlock = toBlock = the block number with hash blockHash. If blockHash is present in the filter criteria, then neither fromBlock nor toBlock is allowed.

Returns

QUANTITY - integer of the number of transactions send from this address.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getLogs","params":[{"topics":["0x00000000000000000000000000000000a94f5374fce5edbc8e2a8697c15331677e6ebf0b"]}], "id":1}'
```

eth_getCode

Returns code at a given address.

Parameters

DATA, 20 Bytes - address

QUANTITY|TAG - integer block number, or the string "latest"

Returns

DATA - the code from the given address.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data
'{"jsonrpc":"2.0","method":"eth_getCode","params":["0xa94f5374fce5edbc8e2a8697c15331677e
6ebf0b", "0x2"],"id":1}'
```

eth_call

Executes a new message call immediately without creating a transaction on the blockchain.

Parameters

Object - The transaction call object

from: DATA, 20 Bytes - (optional) The address the transaction is sent from.

to: DATA, 20 Bytes - The address the transaction is directed to.

gas: QUANTITY - (optional) Integer of the gas provided for the transaction execution.

eth_call consumes zero gas, but this parameter may be needed by some executions.

gasPrice: QUANTITY - (optional) Integer of the gasPrice used for each paid gas

value: QUANTITY - (optional) Integer of the value sent with this transaction

data: DATA - (optional) Hash of the method signature and encoded parameters. For details see Ethereum Contract ABI in the Solidity documentation

QUANTITY|TAG - integer block number, or the string "latest", see the default block paramete

Returns

DATA - the return value of executed contract.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_call","params":[{"see above}], "id":1}'
```

eth_getStorageAt

Returns the value from a storage position at a given address.

Parameters

DATA, 20 Bytes - address of the storage.

QUANTITY - integer of the position in the storage.

QUANTITY|TAG - integer block number, or the string "latest"

Returns

DATA - the value at this storage position.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getStorageAt","params":["0x295a70b2de5e3953354a6a8344e616ed314d7251", "0x0", "latest"], "id":1}'
```

eth_estimateGas

Generates and returns an estimate of how much gas is necessary to allow the transaction to complete. The transaction will not be added to the blockchain. Note that the estimate may be significantly more than the amount of gas actually used by the transaction, for a variety of reasons including EVM mechanics and node performance.

Parameters

Expect that all properties are optional.

Object - The transaction call object

from: DATA, 20 Bytes - The address the transaction is sent from.

to: DATA, 20 Bytes - The address the transaction is directed to.

gas: QUANTITY - Integer of the gas provided for the transaction execution. eth_call consumes zero gas, but this parameter may be needed by some executions.

gasPrice: QUANTITY - Integer of the gasPrice used for each paid gas

value: QUANTITY - Integer of the value sent with this transaction

data: DATA - Hash of the method signature and encoded parameters. For details see Ethereum Contract ABI in the Solidity documentation

QUANTITY|TAG - integer block number, or the string "latest", see the default block paramete

Returns

QUANTITY - the amount of gas used.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_estimateGas","params":[{"see above}], "id":1}'
```

eth_newFilter

Creates a filter object, based on filter options. To get all matching logs for specific filter, call eth_getFilterLogs. To check if the state has changed, call eth_getFilterChanges.

Parameters

Object - The filter options:

fromBlock: QUANTITY|TAG - (optional, default: "latest") Integer block number, or "latest" for the last mined block

toBlock: QUANTITY|TAG - (optional, default: "latest") Integer block number, or "latest" for the last mined block

address: DATA|Array, 20 Bytes - (optional) Contract address or a list of addresses from which logs should originate.

topics: Array of DATA - (optional) Array of 32 Bytes DATA topics. Topics are order-dependent. Each topic can also be an array of DATA with "or" options.

Returns

QUANTITY - A filter id.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_newFilter","params":[{"topics":["0x12341234"]}], "id":1}'
```

eth_newBlockFilter

Creates a filter in the node, to notify when a new block arrives. To check if the state has changed, call `eth_getFilterChanges`.

Parameters

None

Returns

QUANTITY - A filter id.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_newBlockFilter","params":[],"id":1}'
```

eth_getFilterLogs

Returns an array of all logs matching filter with given id.

:::caution `eth_getLogs` vs. `eth_getFilterLogs` These 2 methods will return the same results for same filter options:

`eth_getLogs` with params [options]

`eth_newFilter` with params [options], getting a [filterId] back, then calling

`eth_getFilterLogs` with [filterId] :::

Parameters

QUANTITY - the filter id.

Returns

Array - Array of log objects, or an empty array

For filters created with `eth_newFilter` logs are objects with the following params:

removed: TAG - true when the log was removed, due to a chain reorganization.
false if its a valid log.

logIndex: QUANTITY - integer of the log index position in the block. null when its pending log.

transactionIndex: QUANTITY - integer of the transactions index position log was created from. null when its pending log.

transactionHash: DATA, 32 Bytes - hash of the transactions this log was created from. null when its pending log.

blockHash: DATA, 32 Bytes - hash of the block where this log was in. null when its pending log.

blockNumber: QUANTITY - the block number where this log was in. null when its pending log.

address: DATA, 20 Bytes - address from which this log originated.

data: DATA - contains one or more 32 Bytes non-indexed arguments of the log.

topics: Array of DATA - Array of 0 to 4 32 Bytes DATA of indexed log arguments.

(In solidity: The first topic is the hash of the signature of the event (e.g.

Deposit(address,bytes32,uint256)), except you declared the event with the anonymous specifier.)

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getFilterLogs","params":["0x16"],"id":1}'
```

eth_getFilterChanges

Polling method for a filter, which returns an array of logs that occurred since the last poll.

Parameters

QUANTITY - the filter id.

Returns

Array - Array of log objects, or an empty array if nothing has changed since last poll.

For filters created with eth_newBlockFilter the return are block hashes (DATA, 32 Bytes), e.g. ["0x3454645634534..."].

For filters created with eth_newFilter logs are objects with the following params:

removed: TAG - true when the log was removed, due to a chain reorganization.
false if its a valid log.

logIndex: QUANTITY - integer of the log index position in the block. null when its pending log.

transactionIndex: QUANTITY - integer of the transactions index position log was created from. null when its pending log.

transactionHash: DATA, 32 Bytes - hash of the transactions this log was created from. null when its pending log.

blockHash: DATA, 32 Bytes - hash of the block where this log was in. null when its pending log.

blockNumber: QUANTITY - the block number where this log was in. null when its pending log.

address: DATA, 20 Bytes - address from which this log originated.

data: DATA - contains one or more 32 Bytes non-indexed arguments of the log.

topics: Array of DATA - Array of 0 to 4 32 Bytes DATA of indexed log arguments.

(In solidity: The first topic is the hash of the signature of the event (e.g.

Deposit(address,bytes32,uint256)), except you declared the event with the anonymous specifier.)

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_getFilterChanges","params":["0x16"],"id":1}'
```

eth_uninstallFilter

Uninstalls a filter with a given id. Should always be called when a watch is no longer needed. Additionally, filters timeout when they aren't requested with eth_getFilterChanges for some time.

Parameters

QUANTITY - The filter id.

Returns

Boolean - true if the filter was successfully uninstalled, otherwise false.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_uninstallFilter","params":["0xb"],"id":1}'
```

eth_unsubscribe

Subscriptions are cancelled with a regular RPC call with eth_unsubscribe as a method and the subscription id as the first parameter. It returns a bool indicating if the subscription was cancelled successfully.

Parameters

SUBSCRIPTION ID

Returns

UNSUBSCRIBED FLAG - true if the subscription was cancelled successful.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"eth_unsubscribe","params":["0x9cef478923ff08bf67fde6c64013158d"],"id":1}'
```

Copy

net_version

Returns the current network id.

Parameters

None

Returns

String - The current network id.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"net_version","params":[],"id":83}'
```

net_listening

Returns true if a client is actively listening for network connections.

Parameters

None

Returns

Boolean - true when listening, otherwise false.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"net_listening","params":[],"id":83}'
```

net_peerCount

Returns number of peers currently connected to the client.

Parameters

None

Returns

QUANTITY - integer of the number of connected peers.

Example

Copy

```
curl https://rpc-endpoint.io:8545 -X POST -H "Content-Type: application/json" --data '{"jsonrpc":"2.0","method":"net_peerCount","params":[],"id":1}'
```

3.QI Blockchain's Existing Infrastructure and Ecosystem

A Vanguard of Decentralized Applications

The QI Ecosystem stands at the forefront of decentralized innovation, hosting a myriad of DApps that are pioneering the realms of technology, finance, gaming, and digital collectibles. These applications leverage the robust, decentralized nature of blockchain technology to explore and expand the boundaries of digital interaction and value exchange.

3.1 Finance

Within the financial sector, QI's DApps are redefining traditional financial services due to its fast settlement and low network transaction fees. These platforms facilitate a spectrum of financial activities including decentralized lending, borrowing, interest accrual, and private transactions without necessitating personal data disclosure. By eliminating intermediaries, these DApps offer enhanced security, privacy, and efficiency, heralding a new era of financial sovereignty.

Token Swap

QIDEX

Decentralised exchange on Qi blockchain with an automated liquidity provision protocol for all tokens listed.

Website <https://qidex.site/#/>

Smart Contract Address

QIDEX 0x079Acabcc1fcd9E7211a0Bc294aee02EEfCe77e3

QIDexFactory: 0xadfB415e03dB95f92041096A1e4aa6B80f42178c

QIDexRouter : 0x1a556530bb46c8eC4cdf8c750925952CF89d8E90

Payments

QI USD

Over-Collateralized Decentralized Stablecoin.

Website <https://giusd.online/#/>

Smart Contract Address

QI USD: 0xb7bAdd6361Ba17d60FF2dedDdd18be132aA2c421

Staking

QI Staking

Stake QI and earn QIDEX tokens with high APY.

Website <https://qidex.site/#/stake>

Smart Contract Address

STAKING : 0x5163c4C24cEb5EBF75795986f8E8181AAfc5E38b

Trading

Galaxi Invest

AI based autotrading global stocks.

Website www.galaxiinvest.com

3.2 Art & Collectibles

The arts and collectibles domain within the QI Ecosystem are a hotbed for digital innovation, focusing on reimagining digital ownership and creator compensation. These applications empower artists and creators by providing new avenues for monetization and investment in their work, leveraging blockchain's ability to authenticate and secure digital assets. This not only amplifies earning potential for creators but also introduces novel investment mechanisms for enthusiasts and collectors.

NFT

Hovr

Own your web 3.0 domain, sell unique gaming NFTs items, create your digital avatar for your metaverse identity and much more.

Website <https://hovr.site>

Smart Contract Address

MARKETPLACE ADDRESS: 0x7696B22Fe8cd809CccEc17237D3434277a13bd8D

NEW NFT ADDRESS: 0x0DD226795Bd9542a1b064C150EB2AF01b602aee5

Create Instant website with AI builder: <https://websitebuilder.hovr.site/>

Create your unique web 3 domain: <https://domains.hovr.site/>

Developer tools for NFT use cases: <https://sdk.hovr.site/>

3.3 Gaming

Gaming DApps on the QI platform are transforming the landscape of online gaming by integrating real-world value into virtual experiences. These applications enable players to engage in immersive virtual worlds, compete in strategic battles, and trade collectibles that possess tangible value outside the game. This integration of blockchain technology elevates gaming to a new level, where virtual assets become significant economic entities.

Play-2-Earn

Pawsome

Challenge friends and the online community by backing your puppy to race in the Metaverse!

Website <https://pawsome.host>

Smart Contract Address

PAWSOME : 0x85e09BE9b26d9ad7Ef8AbE84291B800BB

Qie Doodle

Play multiplayer doodle game on QI Blockchain.

Website <https://qiedoodle.com>

WQIE: 0x3aF492C875829B69a0803f4688C54fb867C193DF

Smart Contract Address

DOODLE ITEMS: 0x86C4b8a8e003FEa0eEC1786A1A51a102F54a2F4a

DOODLE SHOP : 0x37aBb1782370D05ddd77cA69C5E3b2254c736F3B

DOODLE QI: 0xf509BE1111aa234078E911940b7BC57E446415B9

HOvR Hooligans (Coming Soon)

The 10,000 largest cities of the world fighting for world domination. Find your allies and conquer the world.

3.4 Technology

The technology sector of the QI Ecosystem is dedicated to decentralizing the tools and platforms used by developers, integrating cryptoeconomic principles into existing technologies, and fostering open-source development. These DApps aim to democratize access to developer tools, encourage collaborative innovation, and create open marketplaces for development work. By doing so, they pave the way for a more inclusive, transparent, and efficient technological landscape.

Mobile apps

QIE Wallet

Send and receive QIE, tokens and NFTs from mobile app with web3 browser and many other features.

Website <https://qiewallet.qiblockchain.online>

Tools

QIE-20 Token Creator

Mint your unique token on QI here. Tokens are fully QIE20 compliant Non-Mintable Tokens. Use the QI token factory to mint your very own token at the click of a button.

Website <https://qidex.site/#/token-creator>

Web3 identities: <https://domains.hovr.site/>

Next generation of the internet with decentralised DNS(dDNS) and .QIE identities and domains. No website renewal fees. Easy payments. Own your data.

Misc

QI Blockchain Docs

Extensive information about Qi Blockchain for developers to build in ecosystem.

Website <https://docs.qiblockchain.online>

QI Blockchain Explorer

Track blocks and transactions. Analyze on-chain data such as tokens and smart-contracts.

Website <https://mainnet.qiblockchain.online>

MLM CONTRACT ADDRESS: 0x2C5aF4aa2bC321b7Efbb9752f1A32392aa3fcDe3

4.QI Blockchain's Applications and Use Cases

4.1 Target Markets and Customers

The QI Blockchain is strategically positioned to serve a diverse array of target markets and customer segments, leveraging its advanced blockchain technology to cater to the evolving needs of various industries. Its robust architecture, coupled with the innovative Proof of Stake (PoS) consensus mechanism, makes it an attractive platform for developers, enterprises, and end-users seeking secure, scalable, and efficient blockchain solutions.

Target Markets for QI Blockchain

- **Decentralized Finance (DeFi):** With its secure and efficient infrastructure, the QI Blockchain is ideally suited for DeFi applications, offering solutions for lending, borrowing, staking, and yield farming. It targets financial institutions, fintech startups, and individual investors looking for alternatives to traditional financial systems.
- **Gaming and NFTs:** The gaming industry and the burgeoning market for non-fungible tokens (NFTs) represent significant opportunities. Game developers, digital artists, and collectors can utilize the QI Blockchain for creating, buying, selling, and trading digital assets and in-game items with real-world value.
- **Supply Chain Management:** Enterprises in logistics and supply chain management can benefit from the QI Blockchain's ability to provide transparent, tamper-proof, and efficient tracking of goods and transactions, from production to delivery.
- **Digital Identity and Privacy:** Organizations and individuals concerned with digital identity verification and privacy can leverage the QI Blockchain for secure, decentralized identity solutions that protect user data and ensure privacy.
- **Enterprise Blockchain Solutions:** The QI Blockchain targets corporations and businesses seeking to integrate blockchain technology into their operations for enhanced security, transparency, and efficiency in processes such as smart contracts, data management, and B2B transactions.
- **Smart Contracts and Decentralized Applications (DApps):** Targeting developers and companies looking to build and deploy smart contracts and DApps, the QI Blockchain offers a robust environment for applications requiring high security and operational efficiency, such as in voting systems, automated compliance, and decentralized autonomous organizations (DAOs).
- **Healthcare:** Healthcare providers, insurers, and researchers can utilize the QI Blockchain for secure and immutable records, enhancing patient privacy, streamlining data sharing, and facilitating the verification of medical credentials.
- **Real Estate:** The real estate market can benefit from blockchain for transparent and efficient property transactions, title management, and fractional ownership, appealing to realtors, investors, and property management firms.
- **Education and Credential Verification:** Educational institutions and accreditation bodies can leverage the QI Blockchain to issue and verify academic credentials, reducing fraud and simplifying the credential verification process.

- **Retail and E-commerce:** Retailers and e-commerce platforms can adopt the QI Blockchain for supply chain transparency, counterfeit prevention, loyalty programs, and secure peer-to-peer transactions, enhancing consumer trust and operational efficiency.

Customer Segments

- **Developers and Tech Entrepreneurs:** Individuals and teams developing decentralized applications (DApps), smart contracts, and blockchain-based services are primary customers, benefiting from the QI Blockchain's developer-friendly tools, resources, and supportive community.
- **Enterprises and SMEs:** Businesses across various sectors looking to adopt blockchain technology for improving operational efficiency, security, and customer trust form a significant customer segment for the QI Blockchain.
- **Investors and Financial Institutions:** This segment includes retail and institutional investors, as well as traditional financial institutions exploring DeFi and other blockchain-based financial services as a means to diversify portfolios and innovate financial products.
- **Artists and Content Creators:** Digital artists, musicians, and content creators seeking to monetize their work through NFTs and digital collectibles are targeted customers, with the QI Blockchain providing a platform for secure, transparent, and direct transactions with fans and collectors.
- **Consumers and End-Users:** Ultimately, the broader consumer market of end-users interacting with applications and services built on the QI Blockchain, including gamers, collectors, and users of DeFi platforms, represents a vast customer base.
- **Blockchain Enthusiasts and Innovators:** Early adopters and technology enthusiasts exploring the latest in blockchain advancements form a core customer segment, driving innovation and adoption within the QI Blockchain ecosystem.
- **Regulatory Bodies and Governments:** Government agencies and regulatory bodies interested in utilizing blockchain for secure, transparent, and efficient administrative processes, including identity verification, voting systems, and public records management.
- **Environmental Advocates:** Organizations and individuals focused on sustainability and environmental impact are drawn to the QI Blockchain's energy-efficient PoS consensus mechanism, aligning with goals for reduced carbon footprints in blockchain operations.
- **Legal and Compliance Professionals:** This segment includes legal firms and compliance officers looking for blockchain solutions to automate and secure contract

management, intellectual property rights, and compliance tracking.

- **Consumers Seeking Privacy and Security:** End-users prioritizing privacy and security in their digital interactions, from financial transactions to social media, represent a significant customer base for DApps built on the QI Blockchain.





The QI Blockchain's focus on security, scalability, and efficiency, combined with its commitment to fostering a vibrant ecosystem, positions it as a leading choice for these target markets and customer segments, driving innovation and adoption of blockchain technology across industries.

4.2 Unique Features of the QI Blockchain

- **Robust Security Measures:** At the forefront of its unique offerings, the QI Blockchain implements rigorous security protocols to safeguard the network and its users. Through advanced cryptographic techniques, regular smart contract audits, and a secure consensus mechanism, it ensures the integrity and safety of transactions and applications built on the platform.
- **Low Transaction Fees:** Recognizing the barrier that high fees can pose to widespread blockchain adoption, the QI Blockchain prioritizes keeping transaction costs minimal. This approach not only makes it more accessible for everyday users and transactions but also appealing to enterprises looking to leverage blockchain technology without incurring prohibitive costs.
- **High Degree of Programmability:** The QI Blockchain is designed with a strong focus on programmability, allowing developers to create complex smart contracts and decentralized applications with ease. This flexibility supports a wide range of use cases, from DeFi and NFTs to supply chain management and beyond, fostering innovation and creativity within the ecosystem.
- **Energy-Efficient Consensus Mechanism:** Leveraging a Proof of Stake (PoS) model, it significantly reduces the energy consumption associated with maintaining the network, aligning with environmental sustainability goals.
- **Rapid Transaction Processing:** Features a block time of just 5 seconds, facilitating fast transaction confirmations critical for a variety of applications.
- **Dynamic Validator Participation:** Opens up the validation process to anyone meeting the staking requirements, enhancing network security and decentralization.
- **Scalability Through Sharding:** Employs sharding to improve network capacity and transaction throughput, addressing scalability challenges head-on.

- **Integrated Governance Model:** Incorporates an on-chain governance system, allowing token holders to participate in decision-making processes.
- **Cross-Chain Interoperability:** Facilitates interactions with other blockchain networks, expanding the potential for collaborative applications.
- **Comprehensive Developer Support:** Offers extensive resources and tools to support developers in building, deploying, and managing DApps on the platform.
- **Ecosystem for Decentralized Finance (DeFi):** Provides the necessary infrastructure for a robust DeFi ecosystem, enabling the development of a wide range of financial applications.

4.3 Competitive Landscape

	 Bitcoin	 Ethereum	 Ripple	 QI
Decentralised	✓	✓	✗	✓
Scalability	✗	✗	✗	✓
Secure	✓	✓	✓	✓
Speed	4.6tps	20tps	1000tps	3000tps
Transaction fees	High	High	Low	Low
Storage	DLT	DLT	DLT	DLT
Consensus	POW	POW->POS	RPCA	POS
Application layer	✗	✓	✗	✓
Environment friendly	✗	✗	✓	✓

5.QI Blockchain Tokenomics & QIE Token Overview

- **Validator Essentials:**
 - **Node Operation:** Validators must run a full node for transaction validation and blockchain integrity.
 - **Staking Minimum:** 50,000 QIE tokens required for validator status, acting as a security deposit to guarantee a vested interest in the network's functionality.
- **Rewards for Validators:**
 - **Transaction Fee Rewards:** Validators earn transaction fees as direct incentives for their participation in the validation process.

- **Staking Rewards:** Additional rewards are available from a dedicated pool of 100 million QIE tokens, claimable after every 259,200 blocks.
- **Halving Schedule:** The staking pool's rewards undergo a halving every two years to promote a sustainable reward structure.
- **Operational Highlights:**
 - **Block Time:** 5 seconds, ensuring quick validations.
 - **Block Rewards:** 0.5 QIE per block, with rewards proportional to staked amounts.
 - **Proportional Distribution:** Rewards are distributed proportionally to the amount of QIE staked, incentivizing larger stakes for increased network security and robustness.

QIE Token Details

- **Native Token:** QIE is the native token of the QI Blockchain, integral to its economic and security frameworks.
-
- **Total Supply and Circulation:**
 - **In Circulation:** Currently, there are 56 million QIE tokens in circulation.
 - **Staking Rewards:** The remaining 92 million QIE tokens from the total supply are allocated for distributing staking rewards to validators on the QI Blockchain.
- **Utility:** QIE tokens are used for transaction fees, validator staking, governance, and accessing services within the ecosystem.
- **Acquisition:** Tokens can be obtained through network participation as a validator, ecosystem transactions, or via exchanges and liquidity pools.

6. Terms & Conditions

An Introduction to the Terms

These Terms of Use provide the terms and conditions under which you, whether personally or on behalf of an entity (“you” or “your”), are permitted to use, interact with or otherwise access the Interfaces or Features provided by QI Blockchain (together with its affiliates, “QI Blockchain,” “we,” “us,” or “our”). These Terms of Use, together with any documents and additional terms or policies that are appended hereto or that expressly incorporate these Terms of Use by reference as well as our Privacy Policy (collectively, the “Terms”), constitute a binding agreement between you and us.

These Terms are applicable to (i) all content, functionality, and features (the “Content Features”) available on any website or graphical user interface hosted by QI Blockchain to which the Terms are posted (each, as applicable, an “Interface”) and (ii) software that QI Blockchain operates or hosts, or makes available via an Interface (the “Technology Features” and together with the Content Features, the “Features”).

NOTICE: PLEASE REVIEW THE TERMS CAREFULLY. BY ACCESSING, INTERACTING WITH OR USING ANY INTERFACE OR ANY FEATURE, YOU AGREE THAT YOU ARE ABLE

TO ENTER INTO A BINDING AGREEMENT AND, AS SUCH, HAVE READ, UNDERSTOOD, AND AGREE TO BE BOUND BY THE TERMS, INCLUDING THE BINDING ARBITRATION AGREEMENT AND CLASS ACTION WAIVER BELOW. IF YOU DO NOT AGREE TO ALL OF THE TERMS, YOU ARE NOT AUTHORIZED TO INTERACT WITH, ACCESS OR USE ANY INTERFACE OR FEATURE.

The Interfaces and Features

a) Overview of Interfaces and Features

Each of the Interfaces are websites, and each have different functionality – some of which only provide information while others contain Features that allow users to send messages to blockchain networks in an entirely self-directed manner.

None of the Interfaces allows us to engage in any transaction with you, nor do the Interfaces facilitate your transactions. Even when the Interfaces appear to be dynamic (e.g., updating or providing new displays when you – on your own accord – provide certain information), at no time is QI Blockchain acting directed by you or on your behalf. In addition, if you click the “Connect Wallet” feature on one of the Interfaces such that your self-hosted cryptocurrency wallet (“Wallet”) is able to provide information to be transmitted to a blockchain network or other blockchain-based application, you should note that (except as otherwise noted herein) QI Blockchain (i) is *not* involved in providing or transmitting any such information to networks, (ii) *cannot* transmit any information to networks or otherwise assist in any transaction, (iii) *never* has access to and cannot control or provide guarantees relating to your Wallet and (iv) has *no authority over* and does *not* take possession or custody of your crypto assets at any time, except as otherwise discussed herein. This also means that QI Blockchain is unable to assist with transactions: please be vigilant in interacting with any immutable blockchain technology. You are solely responsible for familiarizing yourself with your Wallet and its safety and security features, including any private keys and passwords associated therewith. QI Blockchain will not and cannot access your private key, password, or any crypto assets held within your Wallet nor can it reverse any transactions you initiate with your Wallet (or otherwise). QI Blockchain shall not be responsible or liable in any way for how you use your Wallet.

You should also familiarize yourself with the risks associated with transacting on blockchain networks, including but not limited to smart contract vulnerabilities, front end vulnerabilities, hacks, phishing attacks, social engineering attacks, crypto asset volatility and transaction irreversibility.

QI Blockchain has no ability in any way to control, maintain, provide, operate, or improve the smart contract or blockchain protocols underlying the tools and applications displayed on the Interfaces, except as noted herein. We do not effectuate, facilitate or control any transactions initiated via the Interfaces, and QI Blockchain will not be responsible for the result of any transactions, including but not limited to failed, inadvertent, or fraudulent transactions that may result in loss of funds or transaction fees or any other loss or harm to you.

All transactions broadcast to the applicable blockchain network via your Wallet may require the payment of non-refundable network transaction fees, which shall be borne entirely by you. Certain of the Interfaces and Features covered by these Terms include, but are not limited to:

- **QI Blockchain Technology**, which provides information and explanations about (A) software developed by QI Blockchain and others, (B) the QI Blockchain ecosystem including grants, solution providers, governance and community events, and (C) other matters that touch or are relevant to different blockchain networks. This Interface also provides links to other Interfaces as well as third-party websites and interfaces.
- **QI Blockchain Portal**, which requires you to connect your Wallet in order to access any Features, including those that allow you to bridge your crypto assets between Ethereum and certain blockchain networks, to purchase certain crypto assets such that you are able to pay transaction fees when interacting with certain blockchain networks and to view any assets that you have in your Wallet on various blockchain networks. Note that certain of these Features are accessible only via integrations with third parties who have no affiliation or relationship with QI Blockchain and your interactions with those Features will also be governed by any terms of use that the third party has made applicable.
- **Staking on QI Blockchain** which also requires you to connect your Wallet and which allows you to delegate cryptoassets to validators on Polygon proof-of-stake network ("Polygon PoS") in order to provide additional security to the network. This Interface also provides information about validators on Polygon PoS, amounts being staked and the general status of Polygon PoS.
- **Testnets**, which are test environments for building various types of blockchain infrastructure, applications and tooling, among other things.

Except as noted herein, (1) QI Blockchain does not control, maintain, provide, operate, or improve any blockchain networks nor the activity or data thereon and (2) QI Blockchain is not responsible for the activities of persons or entities who develop or use applications or who validate or verify transactions or other operations related to blockchain networks operated by third parties. QI Blockchain cannot control how blockchain networks operated by third parties market their blockchain networks and users should not assume any blockchain networks operated by third parties are affiliated with QI Blockchain, notwithstanding any marketing materials created by such third party that could imply otherwise.

b) Your Acknowledgement Relating to Information on the Interfaces

You hereby acknowledge and agree that all information provided in connection with your access and use of the Interfaces and as it relates to the Features is intended for informational purposes only. QI Blockchain strives to provide accurate information, but it does not guarantee or otherwise warrant that the information is updated, complete, or timely. For this reason, you acknowledge and agree that you are not relying on any of the information on the Interfaces for any purpose and expressly (i) disclaim any reliance on any information on the Interface or within the Features, and (ii) acknowledge that QI Blockchain will not be liable for any such information provided.

You should take all steps to independently verify any information on any Interface on which you intend to rely and should not act based solely on any information contained on any Interfaces, including blog posts, data, articles, links to third-party content, social media content (including Discord, Lens, Farcaster or X), news feeds, tutorials and videos.

None of the information provided on the Interfaces or through the Features should be construed as professional or investment advice, and QI Blockchain does not owe any duties and does not have any obligations to you based on the information provided on the Interfaces or through the Features.

None of the information provided on the Interfaces or any of the Features shall be interpreted as an invitation or inducement to (A) exercise any rights to acquire, dispose of, underwrite, or convert any crypto assets or digital assets or (B) buy, sell, or induce a user to buy or sell any crypto assets or digital assets.

Modifications

We reserve the right, in our sole discretion, to modify the Terms at any time or from time to time. The modified Terms will be posted on an Interface, and will provide the last updated date at the top. Any modified Terms will become effective upon posting. By continuing to access, use or otherwise interact with any Interface or Feature after the effective date of any modification to the Terms, you are providing your explicit agreement to be bound by the Terms as modified. If you do not agree to be bound by any updated Terms, you are prohibited from using, accessing, or otherwise interacting with the Interfaces or Features. It is your responsibility to check any Interface you use regularly for modifications to the Terms of Use.

We also reserve the right, in our sole discretion, to modify the Interfaces or Features at any time and from time to time, with or without notice to you. We may also eliminate any Interface or Feature, at our sole discretion, with or without notice, including deleting or otherwise materially modifying information.

Your Responsibilities and Representations

a) Your Representation

The Interfaces and Features are intended only for users who are 18 years of age or older. If you are entering into the Terms on behalf of an entity, such as the company you work for, you represent to us that you have the legal authority to bind such an entity. If you do not meet these requirements, you are prohibited from accessing, using or otherwise interacting with the Interfaces or Features.

You represent and warrant that you are not, and for the duration of the time you use the Interfaces and Features, will not be (i) the subject of economic or trade sanctions administered or enforced by any governmental authority or otherwise designated on any list of prohibited or restricted parties; (ii) in contravention of any laws and regulations pertaining to anti-money laundering or terrorist financing; (iii) included on the List of Specially Designated Nationals and Blocked Persons maintained by the US Treasury Department's Office of Foreign Assets Control (OFAC) or on any list pursuant to European Union (EU) and/or United Kingdom (UK) regulations (as the latter are extended to the Cayman Islands by statutory instrument); or (iv) operationally

based or domiciled in a country or territory in which sanctions imposed by the United Nations (whether through the Security Council or otherwise), OFAC, the EU and/or the UK apply, or otherwise pursuant to sanctions imposed by the United Nations, OFAC, EU, or UK. If at any point the above is no longer true, then you must immediately cease using the Interfaces and Features.

You acknowledge that you – and only you – are responsible for properly configuring, as applicable, and using the Features or incorporating the Features into your applications or Wallet and for taking appropriate action to secure your data, including without limitation, financial or token information and private keys.

You acknowledge and agree that you have the financial and technical sophistication to properly use and interact with the Interfaces and Features and that you understand the inherent risks of blockchain technology. You understand that transacting in crypto assets and applications utilizing crypto assets is risky and may subject you to cyberattack, loss of crypto assets, unknown exploits, smart contract risks, governance attacks, and other risks related to blockchain transactions. You also understand that transactions executed and settled via smart contracts are not reversible and you may not have recourse in the event of a malicious, fraudulent, or inadvertent transaction.

b) Your Responsibilities & Prohibited Conduct

You agree to access, use or otherwise interact with the Interfaces and Features only in an authorized, proper and appropriate manner and in accordance with these Terms and with all applicable laws.

You agree that you will not:

- violate any applicable laws or regulations through your access to or use of the Interfaces and Features;
- violate the Terms;
- exploit the Interfaces or Features for any unauthorized purpose;
- harvest or otherwise collect information from the Interfaces or Features for any unauthorized purpose;
- use the Interfaces or Features in any manner that could disable, overburden, damage, or impair the Interfaces or Features or interfere with any other party's use or enjoyment of the Interfaces or Features;
- reverse engineer, disassemble, or decompile the Interfaces or Features or apply any other process or procedure to derive the source code of any software included in the Interfaces or Features except to the extent applicable law does not allow this restriction or such rights have been expressly granted to you under a separate license;
- sublicense, sell, or otherwise distribute the Interfaces or Features, or any portion thereof;
- use any data mining tools, robots, crawlers, or similar data gathering and extraction tools to scrape or otherwise remove data from the Interfaces or Features;
- use any manual process to monitor or copy any of the material on the Interfaces or Features or for any other unauthorized purpose without our prior written consent;

- introduce any viruses, trojan horses, worms, logic bombs, or other material which is malicious or technologically harmful to the Interfaces or Features;
- attempt to gain unauthorized access to, interfere with, damage, or disrupt any parts of the Interfaces or Features, the server(s) on which the Interfaces or Features are stored, or any server, computer or database connected to the Interfaces or Features; or
- attack the Interfaces or Features via a denial-of-service attack or a distributed denial-of-service attack or otherwise attempt to interfere with the proper working of the Interfaces or Features.

You acknowledge and agree that in the event that you use an Interface or Feature in a prohibited manner, we may investigate or take any other action we deem necessary, including cooperating with law enforcement or bringing claims against you if they result in harm or damage to QI Blockchain, to rectify the prohibited conduct or any consequences resulting therefrom.

You hereby acknowledge and agree that using the Interfaces or Features may result in tax consequences. It is your responsibility to determine whether there are any tax consequences from any transactions you initiate using the Interfaces or Features, and you are solely responsible for ensuring compliance with applicable tax laws in your tax resident jurisdiction.

c) Your Feedback

You may provide feedback to us or otherwise submit questions and inquiries through some of the Interfaces (“Feedback”). We welcome Feedback relating to improvements or updates to the Interfaces or Features, or inquiries about the same. We will try to review your Feedback, but are not obligated to do so nor are we obligated to release any modifications or improvements you submit to us based on your Feedback.

You acknowledge and agree that we will own all right, title, and interest in and to all Feedback you submit. You represent and warrant that (i) you and your licensors own all right, title, and interest in and to your Feedback; and (ii) you will not violate any intellectual property or other rights of third parties in providing Feedback to us.

Intellectual Property Rights

a) Ownership & License

QI Blockchain or its licensors own all right, title, and interest, including all intellectual property rights, in and to the Interfaces and Features, including any related content and technology, unless otherwise indicated. Subject to the Terms, QI Blockchain hereby grants you a personal, limited, revocable, non-exclusive, non-sublicensable, non-transferable license to use, copy, and distribute in connection with such use the Interfaces and Features. This license is solely intended to allow you to access, use or otherwise interact with the Interfaces and Features.

You acknowledge and agree that you do not receive any other rights to the Interfaces or Features other than those specified in the Terms. Certain Features may be provided to you under a separate license, such as the AGPL 3.0, the MIT License, or another open source (or other) license; third party features or applications integrated into the Interfaces or Features may be subject to other or additional intellectual property licenses and thus, you must review any

terms relevant to those third-party features or applications to determine the relevant license applicable thereto. You agree you will not violate the terms of any such separate license.

b) Reciprocal License

By using any Interface or Feature, you grant us a limited, non-exclusive, sublicensable, worldwide, royalty free license to use, copy, modify and display any content or Feedback you provide to us or that you post on or through any of the Interfaces or Features solely for our business purposes, including but not limited to the purpose of providing the Interfaces or Features for so long as is necessary to do so.

c) QI Blockchain' Trademarks

QI Blockchain' graphics, logos, page headers, button icons, scripts, and service names are trademarks, registered trademarks or trade dress of QI Blockchain (the "QI Blockchain Marks"). All other trademarks not owned by QI Blockchain that appear on this Site are the property of their respective owners, who may or may not be affiliated with, connected to, or sponsored by QI Blockchain. You may use the QI Blockchain Marks only in accordance with, and subject to the terms of, the QI Blockchain Brand Guidelines, which are incorporated herein by reference. You may link to the Interfaces, provided you do so in a way that is fair and legal and does not damage our reputation or take advantage of it, but you must not establish a link in such a way as to suggest any form of association, approval or endorsement on our part without our express written consent.

Third Party Information or Services

As discussed throughout the Terms, the Interfaces and Features may be integrated with or otherwise give access to applications, services, sites, technology, data, operations, features and resources that are provided or otherwise made available by third parties ("Third Party Services").

If the Interfaces or Features contain links to such Third-Party Services, they are provided for your convenience only. We have no control over the contents of those sites or resources, and accept no responsibility for them or for any loss or damage that may arise from your use of them. If you decide to access a Third-Party Service integrated with or linked to any Interface or Feature, you do so entirely at your own risk and subject to the terms and conditions of use for such websites. We reserve the right to withdraw linking permission without notice.

As further noted throughout these Terms, your access and use of Third-Party Services may be subject to additional terms and conditions, privacy policies, or other agreements with those third parties, which QI Blockchain does not control and otherwise may have no relationship with. QI Blockchain also has no control over and is not responsible for such Third-Party Services, including for the accuracy, availability, reliability, verification, or completeness of information or content shared by or available through Third Party Services, or the privacy practices of Third-Party Services.

Your use of any Third-Party Services is directly between you and that third party, and you acknowledge and agree that QI Blockchain will not be responsible or liable, directly or indirectly, for any damage or loss caused or alleged to be caused by or in connection with use of or reliance on any Third-Party Services. You, and not QI Blockchain, will be responsible for any and all costs and charges associated with your use of any Third-Party Services.

Please review any applicable terms, privacy policies or agreements of Third-Party Services prior to using such services. The integration or inclusion of such Third-Party Services does not imply an endorsement or recommendation of such Third Party Services.

Indemnification

a) General

You agree to defend, indemnify, and hold harmless us and our licensors, and each of their respective employees, officers, directors, and representatives (collectively, the “QI Blockchain”) from and against all liability for monetary damages, contractual claims of any nature, economic loss (including direct, incidental or consequential damages), loss of income or profits, fines, penalties, exemplary or punitive damages, and any other injury, damage, or harm, including reasonable attorney’s fees (“Damages”) that relate in any way to any demand, claim, regulatory action, proceeding or lawsuit, regardless of the cause or alleged cause, whether the allegations are groundless, fraudulent, false, or lack merit and regardless of the theory of recovery (“Claim(s)”) arising out of or relating to: (i) your use of the Interfaces or Features (including any use by your customers, users, employees, and other personnel); (ii) breach of the Terms or violation of applicable law by you, your customers, users, employees and other personnel; (iii) a dispute between you and any third party; (iv) your alleged or actual infringement or misappropriation of any third party’s intellectual property or other rights; and (v) your Feedback. In the event we receive any third party subpoena or other compulsory legal order or process associated with Claims described in (i) through (v) above, then in addition to the indemnification set forth above, you will reimburse us for our employees’ and contractors’ time and materials spent responding to such matters at our then-current hourly rates as well as our reasonable attorneys’ fees.

b) Process

If you are obligated to indemnify us, then you agree that we will have the right, in our sole discretion, to control any action or proceeding and to determine whether we wish to settle, and if so, on what terms, and you agree to fully cooperate with us in the defense or settlement of such Claim.

Disclaimers and Limitations of Liability

a) Interfaces and Features

By accessing the Interfaces or Features, you hereby acknowledge and agree that QI Blockchain cannot and does not guarantee the functionality, security, or availability of the Interfaces or Features. The technologies on which the Interfaces or Features rely may be subject to sudden changes and we cannot and do not guarantee that your access to the Interfaces or Features or

the ability to transact thereon will be uninterrupted or error free or that your crypto assets will be secure at all times. You assume all risks related thereto.

b) No Representations or Warranties

THE INTERFACES OR FEATURES ARE PROVIDED “AS IS.” EXCEPT TO THE EXTENT PROHIBITED BY LAW, OR TO THE EXTENT ANY STATUTORY RIGHTS APPLY THAT CANNOT BE EXCLUDED, LIMITED OR WAIVED, NEITHER WE NOR ANY OTHER QI BLOCKCHAIN PARTY MAKES ANY REPRESENTATIONS OR WARRANTIES OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE REGARDING THE INTERFACES OR FEATURES, AND THE QI BLOCKCHAIN PARTIES EXPRESSLY DISCLAIM ALL WARRANTIES, INCLUDING ANY IMPLIED OR EXPRESS WARRANTIES (i) OF MERCHANTABILITY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR QUIET ENJOYMENT, (ii) ARISING OUT OF ANY COURSE OF DEALING OR USAGE OR TRADE, (iii) THAT THE INTERFACES OR FEATURES WILL BE ACCURATE, UNINTERRUPTED, ERROR FREE OR FREE OF HARMFUL COMPONENTS, AND (iv) THAT ANY CONTENT OR ASSETS WILL BE SECURE OR NOT OTHERWISE LOST OR ALTERED.

c) Limitations of Liability

THE QI BLOCKCHAIN PARTIES WILL NOT BE LIABLE TO YOU FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, REVENUES, CUSTOMERS OR USERS, OPPORTUNITIES, GOODWILL, USE, DATA, CONTENT OR OTHER ASSETS), EVEN IF ANY OF THE QI BLOCKCHAIN PARTIES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. FURTHER, NONE OF THE QI BLOCKCHAIN PARTIES WILL BE RESPONSIBLE FOR ANY COMPENSATION, REIMBURSEMENT, OR DAMAGES ARISING IN CONNECTION WITH (i) YOUR INABILITY TO USE, OR ANY DELAY IN THE USE OF, THE INTERFACES OR FEATURES, INCLUDING AS A RESULT OF ANY (A) TERMINATION OF THE TERMS OR YOUR USE OF OR ACCESS TO THE INTERFACES OR FEATURES, (B) OUR SUSPENSION OR DISCONTINUATION OF ANY OR ALL OF THE INTERFACES OR FEATURES, OR, (C) ANY UNANTICIPATED OR UNSCHEDULED DOWNTIME OF ALL OR A PORTION OF THE INTERFACES OR FEATURES FOR ANY REASON; (ii) THE COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; (iii) ANY INVESTMENTS, EXPENDITURES, OR COMMITMENTS BY YOU IN CONNECTION WITH THE TERMS OR YOUR USE OF OR ACCESS TO THE INTERFACES OR FEATURES; (iv) ANY UNAUTHORIZED ACCESS TO, ALTERATION OF, OR THE DELETION, DESTRUCTION, DAMAGE, LOSS OR FAILURE TO STORE ANY OF YOUR DATA; OR (v) ANY CHANGE IN VALUE OF ANY CRYPTOASSET. IN ANY CASE, THE QI BLOCKCHAIN PARTIES’ AGGREGATE LIABILITY UNDER THESE TERMS WILL NOT EXCEED \$100. THE LIMITATIONS IN THIS SECTION APPLY ONLY TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW.

Governing Law, Dispute Resolution and Class Action Waiver

a) Governing Law

The Terms – and your use of the Interfaces and Features – are governed by the laws of the Cayman Islands, without regard to conflict of laws rules. Any arbitration commenced against us is subject to the Arbitration Rules of the Cayman International Mediation and Arbitration Centre.

b) Dispute Resolution

Prior to commencing any legal proceeding against us of any kind, including an arbitration, you and we agree that we will attempt to resolve any Claim by engaging in good faith negotiations. Such negotiations require that the aggrieved party provide a written notice to the other party specifying the nature and details of the dispute (the “Initial Notice”). The party receiving such notice shall have twenty days to respond, and within forty-five days after the Initial Notice was sent, the parties shall meet and confer in good faith to try and resolve the Claim. If the parties are unable to do so within ninety days of the Initial Notice, the parties may agree to mediate their dispute or either party may submit to arbitration according to these Terms.

c) Mandatory Arbitration Provision

Any dispute, claim or controversy arising out of or relating to the Terms, Interfaces or Features, or the breach, termination, enforcement, interpretation or validity of the Terms, including the determination of the scope or applicability of this agreement to arbitrate, will be determined by arbitration in the Cayman Islands before one arbitrator. This clause will not preclude parties from seeking provisional remedies in aid of arbitration from a court of appropriate jurisdiction. YOU UNDERSTAND THAT BY AGREEING TO THE TERMS, THE PARTIES ARE EACH WAIVING THE RIGHT TO TRIAL BY JURY OR TO PARTICIPATE IN A CLASS ACTION OR CLASS ARBITRATION.

d) Waiver of Right to Bring Class Action or Representative Claims

Any arbitration under the Terms will take place on an individual basis – class arbitrations and class actions are not permitted.

To the fullest extent permitted by applicable law, you agree that any proceeding to resolve any dispute, claim or controversy will be brought and conducted only in your individual capacity and not as a party (plaintiff or otherwise) or member of any class (or purported class), consolidated proceeding, multi-plaintiff proceeding or representative action or proceeding.

Any arbitration will not be permitted to be consolidated or aggregated with any other arbitration and the arbitrator will not have any authority to do so, and will not have the authority to make an award to any person or entity not a part of the individual arbitration in which you are a party. You further agree that any arbitrator may not preside over any form of class action involving you and us.

e) Updated Terms Require Arbitration

If you have been using an Interface or Feature, and thus, have agreed to the Terms, but determine eventually to cease doing so based on updates made to any Terms, your agreement to arbitrate any dispute with us and your waiver of any class action or representative claims remains in full force and effect.

No Relationship or Assignments

Nothing in the Terms shall be construed to create any relationship between you and us other than as defined herein. Neither you nor us is an agent of each other under these Terms or otherwise, and you shall have no right to hold yourself out as in any way having a relationship with us other than as someone using, accessing or otherwise interfacing with the Interface and/or Features.

You agree that you are not permitted to assign or otherwise transfer any of your rights and obligations under the Terms, but QI Blockchain may assign or transfer the Terms, in whole or in part, without restriction. Any assignment or transfer in violation of this Section will be void. Subject to the foregoing, the Terms will be binding upon, and inure to the benefit of, the parties and their respective permitted successors and assigns.

Entire Agreement

The Terms, including any policies that expressly incorporate the Terms by reference, constitute the entire agreement between you and us regarding the subject matter herein. The Terms supersede all prior or contemporaneous representations, understandings, agreements, or communications between you and us, if any, whether written or verbal, regarding the subject matter of the Terms.

No Waiver

The failure by us to enforce any provision of the Terms will not constitute a present or future waiver of such provision nor limit our right to enforce such provision at a later time. All waivers by us must be in writing to be effective.

Severability

If any portion of the Terms are held to be invalid or unenforceable, the remaining portions of the Terms will remain in full force and effect. Any invalid or unenforceable portions will be interpreted to effectuate the intent of the original portion. If such construction is not possible, the invalid or unenforceable portion will be severed from the Terms but the rest of the Terms will remain in full force and effect.

7. Privacy Policy

This Privacy Policy (this “Policy”) describes how QI Blockchain UI (Cayman) Ltd. and its affiliates (“QI Blockchain”, “us” or “we”) may collect, use and disclose information in connection with your access and/or use of any Interface or Features. Your use of the Interfaces and Features is subject to this Policy as well as our Terms of Use and any documents and additional terms or policies that expressly incorporate the Terms of Use (collectively, the “Terms”). Please read this Policy and the Terms carefully to ensure you understand them. Capitalized terms not defined herein have the same meaning as in the Terms.

This Policy does not apply to any products, services, websites, or content offered or provided by third parties and QI Blockchain is not responsible in any way for those third-party offerings; please review any separate privacy policies made available by those third parties.

We may update this Policy from time to time. If we make any changes, we will change the Last Updated date above. We encourage you to periodically review the Policy for the latest information on our privacy practices.

Any modifications to this Policy will be effective upon our posting of the updated Policy. In all cases, your continued use of the Interfaces or the Features following the posting of any updated Policy indicates your acceptance of the updated Policy.

1. Information We Collect

2. Information You Give Us

When you access the Site, we may collect the following information:

- When you opt in to various programs, sign up to receive marketing information, send in support requests/provide feedback or otherwise voluntarily interact with us or the Interfaces:
 - Contact information, such as name, email address, profile picture, user name, or social media information.
 - Your preferences for receiving marketing information and communications from us.
- Your public wallet address when you connect your wallet to access certain Features

Information Collected Automatically

We may collect automatically certain limited information when you access, use, or interact with any Interface or Features, such as:

- Device type, browser type and version
- Operating system and version
- IP address
- Publicly available blockchain data
- Analytics about aggregate numbers of users and usage types (i.e., number of page views, event counts, and aggregate acquisition metrics), and information such as how many users in the aggregate are using certain Features; and aggregate location data across users including countries and regions from which users access the Site or Features

For information about how we use tracking technologies, please see our Cookie Policy.

Information Collected from Third Parties

We may receive additional information about you from third parties we work with (including contractors, collaborators, service providers, and analytics providers). This information may be combined with other information you provide to us or that we automatically collect.

How We Use Information

We may use information about you to:

- Provide, maintain, support and improve the Interfaces and Features and respond to inquiries related to the same;
- Comply with our legal and regulatory obligations, as or if necessary;

- Prevent, detect and investigate fraudulent, abusive or harmful activities;
- Allow you to personalize or personalize your experience with the Interfaces or the Features;
- Facilitate events and provide information to you about events;
- Provide support for the Interfaces and the Features, including resolving issues and responding to your questions and feedback;
- Comply with law if we have a legal obligation to collect, use or retain information about you or comply with legal requests like subpoenas or requests from government authorities;
- Analyze usage trends to permit access to the Interfaces or provide the Features;
- Enforce the Terms, this Policy and/or other policies; and
- Take certain actions that you have asked us to and provided consent for us to take.
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You agree and acknowledge that we may use information that does not identify you (including information that has been aggregated or de-identified) for any purpose except as prohibited by applicable law.

How We Share Information

We may share certain information about you with third parties, such as service providers, professional advisors, affiliates and others. We may share information about you with individuals and entities that provide services to us or help us operate the Interfaces or the Features, such as marketing, event hosting, logistics planning, analytics, email delivery, and database management services, as well as other professional service providers providing services to us. Any such sharing of information will be in accordance with this Policy.

We may share information with third parties when we enter into a business transaction, including mergers, acquisitions, reorganizations, or a sale or transfer of all or part of our organization or assets.

We may share information about you when we believe release is necessary to comply with law, enforce the Terms and other agreements with you, or protect the rights, property, or security of QI Blockchain, our agents and employees or users. This includes sharing information with other organizations for fraud prevention and detection purposes.

You may permit us to share your information with other entities or individuals of your choosing. Those uses will also be subject to the privacy policies of the entities or individuals receiving the information.

Location of Information

Please be aware that information collected through the Interfaces or the Features may be transferred to, processed, stored, and used in the Cayman Islands, and other jurisdictions. Data protection laws in the Cayman Islands and other jurisdictions where we have affiliates may be different from those of your country of residence. Your use of the Interfaces or the Features or provision of any information therefore constitutes your consent to the transfer to and from, processing, usage, sharing, and storage of information about you in the Cayman Islands and

other jurisdictions as set out in this Policy.

Access, Deletion, and Choice

If you need to update or delete certain information about you or your interactions with the Interfaces or the Features, you can contact us for assistance at info@qiblockchain.online. You may have choices about the collection and use of information about you. You can choose not to provide certain information, but then you might not be able to use the Interfaces or Features.

- **Communications:** If you do not want to receive messages from us related to the QI Blockchain ecosystem, please unsubscribe or adjust your communication preferences.
- **Browser and Devices:** The help feature on most browsers and devices will tell you how to prevent your browser or device from accepting new cookies, how to have the browser notify you when you receive a new cookie, or how to disable cookies altogether. Please see our [Cookie Policy](#) for more information.

For additional information related to certain jurisdictions, see Section 9 below.

Children's Information

The Interfaces and the Features are intended for general users who are 18 years of age or older, and are in no way directed at children. We do not knowingly collect personal information from children. If you believe such information has been collected in error, please email info@qiblockchain.online to notify us of this.

Retention of Information

We retain information collected in accordance with this Policy only for so long as it is necessary to fulfill the relevant purposes described in this Policy, unless a longer retention period is required or permitted by law such as for tax, accounting, fraud prevention, investigative, and dispute resolution purposes, or to establish or defend a Claim. In some instances, we may anonymize personal information about you such that it can no longer be used to identify you, in which case we can use such information indefinitely without further notice to you.

Notices

If you have any questions about this Privacy Policy, please Contact Us at:
info@qiblockchain.online

If you interact with the Interfaces or the Features on behalf of or through your organization, then your information may also be subject to your organization's privacy practices and you should direct privacy inquiries to your organization.

Additional Information for Certain Jurisdictions

California

If you are a California resident, you have certain additional rights with respect to personal information about you under the California Consumer Privacy Act of 2018 ("**CCPA**").

We are required to inform you of:

- What categories of information we may collect about you, including during the preceding 12 months: See the section “What information do we receive from you or collect.”
- The purposes for which we may use your personal information, including during the preceding 12 months: See the section “How we use information.”
- The purposes for which we may share your personal information, including during the preceding 12 months: See the section “How do we share information.”
- In the preceding 12 months, we have not sold any personal information of consumers.

You have the right to request to know: (i) the categories of personal information we have collected about you in the last 12 months; (ii) the specific pieces of personal information we have about you; (iii) the categories of sources from which that personal information was collected; (iv) the categories of your personal information that we sold or disclosed in the last 12 months, if applicable; (v) the categories of third parties to whom your personal information was sold or disclosed in the last 12 months; and (vi) the purpose for collecting and selling your personal information, if applicable. These rights are subject to limitations as described in the relevant law. We may deny your request if we need to do so to comply with our legal rights or obligations.

We will not discriminate against any user for exercising their CCPA rights.

You may exercise these rights yourself or you may designate an authorized agent to make these requests on your behalf. To protect your information, we may need to verify your identity before processing your request, including by collecting additional information to verify your identity, such as government issued identification documents. We will not fulfill your request unless you have provided sufficient information for us to reasonably verify you are the individual about whom we collected personal information. We will only use the personal information provided in the verification process to verify your identity or authority to make a request and to track and document request responses, unless you initially provided the information for another purpose. When we verify your agent’s request, we may verify your identity and request a signed document from your agent that authorizes your agent to make the request on your behalf. To protect your personal information, we reserve the right to deny a request from an agent who does not submit proof that they have been authorized by you to act on their behalf.

If you would like to exercise any of these rights, please contact us (see “Contact Us” section).

European Economic Area, the United Kingdom, and Switzerland

If you are a data subject in the European Economic Area, the United Kingdom, or Switzerland, you have certain rights with respect to your personal data pursuant to the General Data Protection Regulation of the European Union (“GDPR”) and similar laws. This section applies to you.

References to “personal information” in this Policy are equivalent to “personal data” as defined under GDPR.

QI Blockchain is the controller of your personal information as covered by this Policy for purposes of GDPR. Our address is as follows: QI Blockchain, **info@qiblockchain.online**
We process your personal data in reliance on the legal basis below. Where the purpose of processing is:

- **To provide and improve the Interfaces and the Features:** We process your personal data as necessary to provide the Interfaces and the Features to you.
- **To comply with the law:** We process your personal data as necessary to comply with applicable laws and our legal obligations.
- **For compliance, fraud prevention, and safety:** We have a legitimate interest in processing your personal data, as described in this Policy, and our reasons for doing so outweigh any prejudice to your data protection rights. We also process your personal data as necessary to comply with our legal obligations.
- **To send marketing communications; or for research and analytics:** We have a legitimate interest in processing your personal data, as described in this Policy, and our reasons for doing so outweigh any prejudice to your data protection rights.
- **With your consent:** We process certain of your personal data with your consent. You may withdraw your consent at any time in the manner indicated when you provided consent to the collection of your personal data through your interactions with the Site.

You may: (i) ask whether we have any personal data about you and request a copy of such personal data; (ii) request that we update or correct inaccuracies in your personal data; (iii) request that we delete your personal data; (iv) request a portable copy of your personal data; (v) request that we restrict the processing of your personal data if such processing is inappropriate; and (vi) object to our processing of your personal data. These rights are subject to applicable law.

If you would like to exercise any of these rights, please contact us (see “Contact Us” section above). To protect your information, we may need to verify your identity before processing your request, including by collecting additional information to verify your identity, such as government issued identification documents.

If you would like to submit a complaint about our use of your personal data or our response to your requests regarding your personal data, please Contact Us above. You may also lodge a complaint with your local data protection authority.

To the extent we transfer your personal data outside the European Economic Area, we will do so in accordance with the terms of this Policy and applicable data protection law.