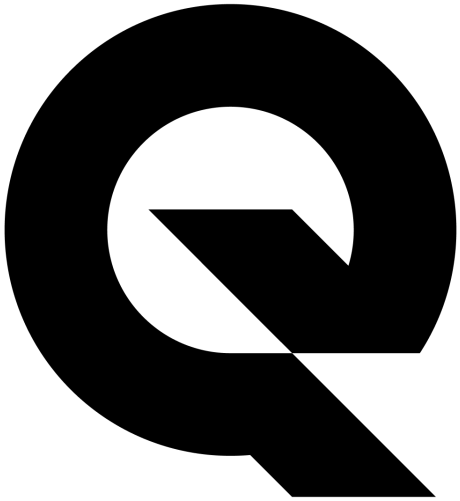

QUANTINIUM

WHITE PAPER v3.2

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I. Outline

II. Abstract

Global market growth for Wi-Fi hardware, software, and business solutions continues to grow at breakneck pace, with a projected Compound Annual Growth Rate [CAGR] of 17.8% [1] and approximately 22 billion connected devices [2], a figure which will only continue its exponential expansion through the steady proliferation of wireless network infrastructure and with the introduction of new and novel technologies.

At the vanguard of the new online economy, is the introduction and adoption of decentralized currency; a massive shift in the financial structures which underpin global trade. Introduced in just 2009, market capitalization for cryptocurrency reached more than $2.3 Trillion USD in 2024 [3], with nearly 1 in 5 Americans owning and trading at least one form of decentralized currency [4]. It is impossible to overstate the long term implications this emerging market will have on future economic trends. Significantly, global acceptance and legitimization of cryptocurrency has dramatically accelerated colloquial familiarity with blockchain concepts, as well as public perception of its utility, efficacy, and profitability [5]. What began predominantly as a speculative financial niche has quickly garnered attention for its technological viability as governments and corporations adopt its conceptual premises [6]. The decentralization of banking institutions through open-source ledgers represents a new phase of blockchain banking so disruptive that traditional instruments are attempting to integrate the concepts into their own business models to avoid conceding market share [7].

The mass adoption of cryptocurrency certainly faces institutional headwinds. Among these, the most prevalent stem from government intervention, as the widespread adoption of cryptocurrency accelerates international energy expenditures [8], jeopardizes financial surveillance efforts [9], and increases the demand for computer components and microchips, accelerating market scarcity and further disrupting existing supply chains [10].

Mitigation of these issues is simple, but novel. The majority focus of cryptocurrency mining efforts thus far have focused on energy-demanding proof of work mining protocols, or on the slow and cost-intensive process of manufacturing and distributing new hardware to end users. This strategy has proven deleterious to sustained growth as bottlenecks in energy and logistics particularly contribute to difficulties with network adoption. Hence, instead of constructing additional computational infrastructure to facilitate the crypto mining process, Quantinium's approach involves leveraging existing and easily accessible systems to drive and anchor the same processes. This innovative technique harnesses the consistently expended but underutilized power resources of these devices through the implementation of reconstructive software. The execution of this strategy is both efficient and expeditious, ensuring optimal utilization of available resources.

Importantly, Quantinium serves a real world purpose that extends beyond decentralized currency. Tokens utilized by the Quantum Wi-Fi network are designed to be expended during the acquisition of Wi-Fi service through a decentralized network of Routers that broadcast to the general public. These access points provide high-quality decentralized internet connectivity at pricing that disrupts the regional provider monopolies and greatly reduces the per-user costs of equipment, distribution and installation. The proliferation of these network nodes [colloquially, Q-Spots] is incentivised through the distribution of Quantinium tokens [QTI], which are mined when Routers collect data credits [QDC] proportional to bandwidth utilized by connected Devices. The owner of the equipment [Provider] retains a portion of the total profit generated through the use of their Router, and payments are calculated and paid in real time. These elements form the fundamental infrastructure and mechanism of the Quantum Wi-Fi [Quantum Wi-Fi] network.

Current estimates place the existing number of routers globally at 750 million devices, with more than five billion internet users worldwide [11] and a growth rate of approximately 500 thousand new users daily [12]. Assuming a Provider is already in possession of a compatible router and continuously maintains their internet service [an assumption that seems feasible since ownership of existing hardware and service is prolific globally] the cost of entry for bringing a node onto the Quantum Wi-Fi Network is effectively zero. This zero-cost network entry is unique to the Quantinium ecosystem, offering potential monetary incentives to equipment owners for bringing a new device online, while incurring no monetary cost that would cause a Provider to offboard from the Network, regardless of earnings. The result is a profitable, scalable, and decentralized network of wireless nodes [Q-Spots] providing cheap internet access to millions of users without the need

to distribute new hardware or install expensive telecommunications equipment. Demand for these services are prolific, and user provision means market penetration is assured and roughly proportional to demand.

The Quantum Wi-Fi Network operates on its own blockchain, supports a decentralized wireless networking system, and utilizes two native protocol tokens [QTI and QDC, respectively] for transactions on its network. The blockchain operates using the Quantum Consensus Protocol, and an emergent but increasingly preferential validation process called Proof of Coverage [*Section 5*]. Providers in the Quantum Wi-Fi Network own and operate Wi-Fi compatible Routers, and provide Wi-Fi coverage to Subscribers in the Router's local geographic area. The location of these Routers is continuously verified and each submits time-stamped Geo-IP and GNSS proofs to the Quantum Wi-Fi Network for validation at calculated intervals. Validators that maintain compliance standards are elected to an asynchronous Byzantine Fault-Tolerant Consensus Group, where they receive post-quantum encrypted transactions submitted by other Providers and form them into blocks on the blockchain.

Together, these mechanisms distribute internet service,network infrastructure, security protocols, and cryptocurrency into the global market, disrupting multiple

III. Index

3.1 Common Terms

Least Cost Routing [LCR]: The process of analyzing and selecting the most advantageous path for outbound data traffic, and routing based on the lowest available cost for a given route.

Oracle: A blockchain Oracle is a third-party service that connects smart contracts to external systems and executes them based on inputs and outputs from the real world. This coupling of on-chain code and off-chain infrastructures supports decentralized applications that dynamically respond to real-world events and cooperate with traditional systems.

Proof of Coverage The Proof of Coverage model is a novel alternative to the Proof of Work method of transaction validation employed by popular cryptocurrencies such as Bitcoin and Ethereum. Proof of Coverage allows Providers to substantiate claims that they are providing Wi-Fi coverage to a given area by using various geo-location demonstrations.

Q-Affiliate The Quantum Wi-Fi Network continues its focus on decentralization by extending the concept into its community efforts. It does this by creating an incentive program for specified actions which benefit the expansion and development of the Network. Affiliates are individuals and corporations who have completed our training and certification process and are qualified to receive affiliate rewards and warrants, paid in QTI, for completing specific actionable events.

Quantum Wi-Fi [Quantum Wi-Fi] A proprietary and standards-compliant wireless network protocol designed for use by Subscribers who connect to a decentralized global network of Routers for Wi-Fi service.

QuantumPAY [QPay] Located within the Q-WALLET application, QuantumPAY is a unique peer-to-peer payment feature with instantaneous settlement time. Users will enter a [Phone Number, Username, or QR Code], select an amount and press confirm to send, or they can simply use Near Field Communication [NFC] to securely transfer funds via "tap-to-pay." Users can also request money via comment or invoice, with an exchange tracker that gives them the current USD equivalent for reference.

NFC Near Field Communication technology allows users to make secure transactions, exchange digital content, and connect electronic devices with touch or gestures using proximity protocols.

Quantum Ads A completely new exchange platform for buying and selling advertising space on the Quantum Wi-Fi Network which directly competes with existing monopolies through a unique and disruptive mechanism. Artificial Intelligence is utilized so that advertising is predictive and localized instead of responsive and generalized.

Quantinium [QTI] The native token of the Quantum Blockchain, which is bought, sold, traded, or converted into Quantum Data Credits [QDC] when used for obtaining wireless access. Quantinium has a limited supply of tokens, with scheduled issue rates and halving schedules, concrete tokenomics, and an inflation control mechanism.

Quantum Consensus Protocol [QCP] A method of validating transactions on the blockchain which combines Proof of Coverage with a Byzantine Fault Tolerant protocol to create a censor-proof, permissionless system of verification.

Quantum CRM [QCRM] A proprietary Customer Relationship Management platform for Q-Affiliates containing industry standard tools including email and SMS auto-response and broadcast interfacing, analytics, lead tracking and scoring, etc. Later, a blockchain-based post-quantum secure CRM designed for use by the general public which will grossly undercut the price point of existing providers while providing unprecedented speed, unlimited communications freedom and motility, and quantum-impenetrable client list privacy.

Quantum Wi-Fi [Quantum Wi-Fi] An entirely new, blockchain-based communications network built to service Wi-Fi accessibility by creating a mesh network of independent Providers which provide Wi-Fi coverage to internet users globally. The Quantum Wi-Fi Network provides a system for identifying new Devices, calculating Device density, identifying and addressing fraud, authenticating transactions, and providing cryptographic guarantees of data transmission.

QTRADE A native Quantinium exchange located within the Quantinium Wallet app that enables Subscribers, Providers and Validators to buy, swap and stake Quantinium.

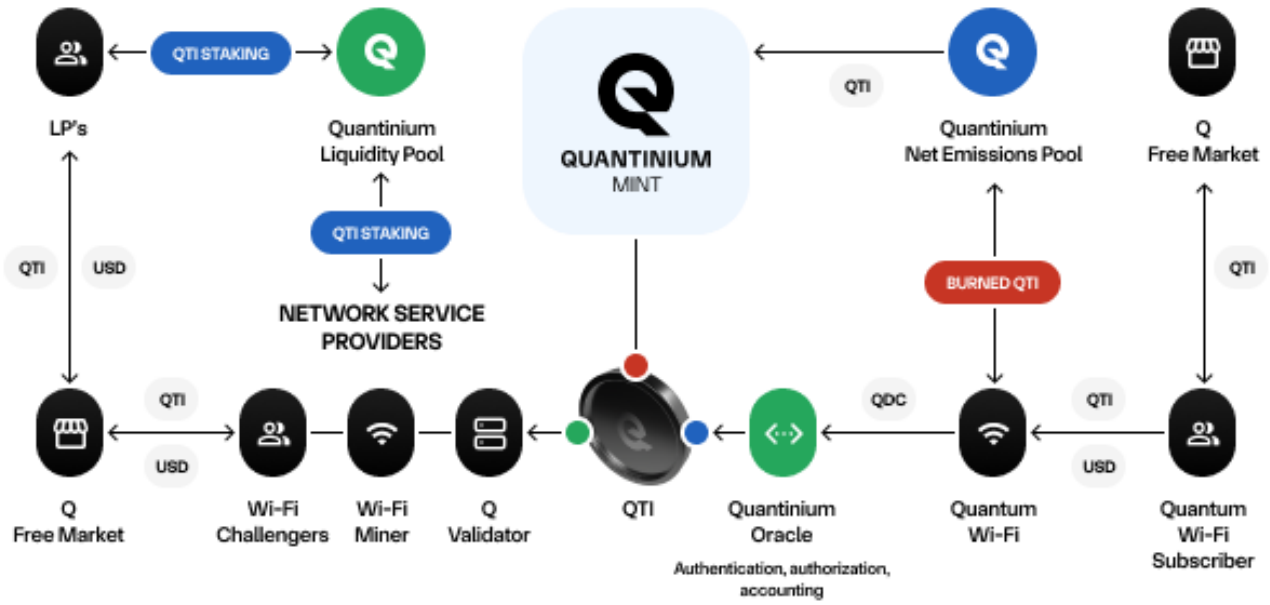
Quantinium Wallet A free mobile application for iOS and Android that stores earnings from integrated devices on the Quantum Wi-Fi Network, as well as functionality to buy, sell, trade or make payments in fiat currencies or cryptocurrency.

3.2 Wireless Network Overview

The Quantum Wi-Fi Network is a globally distributed, decentralized Wi-Fi access network on a purpose-built blockchain with a native Quantinium token [QTI] which represents bandwidth. Providers are independent entities in possession of Wi-Fi routers, who have re-configured their equipment through the Android/IOS Application. Providers broadcast Wi-Fi in their local area, and earn QTI when data is exchanged via their connection. Providers join the Quantum Wi-Fi Network by updating the configuration of their router and announcing their physical location, which appears as a unique type of entry in the blockchain during initial registration or scheduled validation. Providers are paid once they send or transmit data from the Subscriber to the internet and are paid in QTI per packet.

3.3 Burn and Mint Equilibrium [BME]

Quantinium utilizes a “Burn and Mint” equilibrium to regulate the velocity of Quantinium Tokens [QTI] to validators, miners and challengers. This mechanism, often associated with token supply control, takes on a unique role within the Quantinium ecosystem. Quantinium Tokens [QTI], the native currency of the network, are intentionally burned in order to cause slow deflation as onboarding to the network commences. In this process, QTI tokens are permanently removed from circulation, curbing inflation and enabling precise control over the token supply to preempt speculation, which can destabilize the use of the currency which is essential to facilitate the use of a utility. These burned QTI are transmuted into Quantum Data Credits [QDC], acting as the essential service credit within the wireless ecosystem. Quantum Data Credits enable various transactions and serve as the lifeblood of the network, empowering subscribers, challengers, miners, validators, and oracles to engage in seamless data transfers and transactions.



3.4 Oracles

Critical connection occurs through Oracles on the Quantum Wi-Fi Network. Oracles authenticate, authorize, and account all data transmissions between the internet and Subscribers, Providers, Validators, and Challengers. As part of their role, they reward Challengers, Providers and Validators with freshly minted QTI Tokens. This interplay between Subscribers, Providers, Validators, and Oracles forms a symbiotic relationship within the ecosystem. Subscribers gain internet access, Providers and Validators ensure network coverage and security, and Oracles maintain data flow. In return, Providers and Validators are rewarded with QTI Tokens, creating a continuous cycle of value and utility. Quantinium's pioneering approach to the Burn and Mint mechanism, integrated with a decentralized Wi-Fi network, exemplifies the potential of blockchain technology to reshape connectivity and finance. It offers a glimpse into a future where traditional barriers to access and transactions are dismantled, fostering a more inclusive and decentralized world.

3.5 Quantinium Tokenonomics

The tokenomics of the Quantinium blockchain is carefully structured to ensure a balanced and sustainable ecosystem, fostering growth, incentivizing participation, and ensuring value retention. The model is divided into macro and micro tokenomics, each addressing different aspects of the blockchain's economic framework.

3.5.1 Limited Supply

Quantinium operates with a fixed and limited supply of Quantinium Tokens, operating on the principle that deflation and scarcity of the tokens will drive their value over time, making them an attractive store of value for participants, and consumers alike.

3.5.2 Burn and Mint Equilibrium

This mechanism operates between Quantinium Tokens and Quantum Data Credits [QDC]. While Quantinium Tokens can be converted into Quantum Data Credits, the reverse is not possible. This one-way conversion ensures that Quantinium Tokens remain the primary store of value within the network, whereas Quantum Data Credits serve as the settlement currency for all internet data transmitted across the network. This structure helps maintain the intrinsic value of Quantinium Tokens while facilitating smooth arbitrage and ease of accounting on the network.

3.5.3 Community and Rewards Allocation

To foster a robust and engaged community, 50% of the total token supply is allocated for blockchain rewards and community incentives. This significant allocation is designed to ensure continuous community engagement, network security, adoption, and ecosystem growth. These rewards are distributed through various mechanisms, including staking rewards, validator incentives, warrants, and community grants, ensuring that all participants are adequately incentivized to participate.

3.5.4 Blockchain Revenue to Quantinium

The Quantinium blockchain has implemented a 3% global fee on all transactions conducted within the network. This fee structure serves as a revenue model for the blockchain while ensuring that participants are contributing to the ecosystem's sustainability. Importantly, 1% of the total transaction fee is dedicated to charitable causes. This initiative reflects Quantinium's commitment to social responsibility and its dedication to giving back to the community. By integrating charitable donations into its fee structure, Quantinium ensures that its growth and success benefit broader societal causes.

3.5.5 Data Revenue Distribution

The revenue generated from data transmission on the Quantinium network is distributed among three primary stakeholders:

i. **Wi-Fi Providers:** Receive 35% of the data transmission revenue. This incentive encourages providers to maintain and expand their Wi-Fi infrastructure, ensuring robust and widespread network coverage.

ii. **Blockchain Validators:** Also receive 35% of the data transmission revenue. Validators play a crucial role in maintaining the security and integrity of the blockchain. By rewarding Validators, Quantinium ensures that its network remains secure and efficient.

iii. **Quantinium Treasury:** Retains 30% of the data transmission revenue. This portion is used for continuous development, innovation, and the overall sustainability of the Quantinium ecosystem. By reinvesting in the ecosystem, Quantinium ensures ongoing improvements and the introduction of new features and services.

iv. **Staking Requirements and Rewards:** To participate as a validator in the Quantinium network, individuals are required to stake approximately $500 USD worth of Quantinium Tokens. Validators earn staking interest rewards, which serve as an incentive for their participation and commitment to maintaining the network's security and integrity. Providers also earn staking interest rewards automatically, which, coupled with slow deflation, incentivises them to hold QTI over a longer term, stabilizing prices further.

Both providers and challengers can earn Quantum Data Credits (QDC) by using referral codes during the setup of new Wi-Fi hotspots. This mechanism encourages network expansion and user acquisition, as well as ensuring continuous growth by and the establishment of new connections within the ecosystem.

3.5.6 Warrants and Accountability

Quantinium empowers its subscribers by allowing them to issue warrants for Wi-Fi locations that exhibit issues such as non-functionality, incorrect placement, or slow data transmission. This feature ensures accountability and quality control within the network. Challengers who verify or witness these warrants can collect the staking rewards of repeat offenders, ensuring that network standards are maintained and that issues are promptly addressed. This system of checks and balances fosters a reliable and high-quality network experience for all users.

3.5.7 Conclusion

By aligning the interests of various stakeholders, including token holders, Validators, Providers, and Subscribers, Quantinium ensures that all participants are incentivized to contribute to the network's growth and success. The integration of charitable donations and community rewards further reinforces Quantinium's commitment to social responsibility and community engagement. Through this meticulously designed tokenomic structure, Quantinium aims to create a thriving digital economy that benefits all its participants.

IV. Quantum Wi-Fi Network

4.1 Overview

The telecommunications sector is experiencing major transformations that will shape the way networks and services are designed and deployed for the next decade. Among these is a concurrent explosion in the number of applications and services demanded by users who want to access them while mobile. In keeping with this demand, the Quantum Wi-Fi Network employs a cloud-computing paradigm which reduces network costs by crowdsourcing the access layer on existing communal hardware. There are three types of members in the Quantum Wi-Fi Network: Quantum Wi-Fi Subscribers, Quantinium Providers, and Quantinium Validators.

4.1.1 Quantum Wi-Fi Subscribers

Subscribers of the Quantum Wi-Fi Network access the internet through Provider Routers on the network and pay using data credits [QDC] for connectivity. Subscribers will utilize a desktop or mobile application that enables them to buy, spend, or exchange QTI and/or to convert to QDC on an integrated trading platform or to directly subscribe with fiat currency. The application also establishes relationships between global Routers and Subscriber connected Wi-Fi Devices.

4.1.2 Quantinium Providers

Quantum Wi-Fi Providers extend Wi-Fi coverage to the Network by utilizing existing wireless equipment that has undergone an autoconfiguration update via Quantinium Wallet so that it is usable by the network. These Q-Spots provide the essential bridge between Subscribers and upstream providers. To become a Provider in the Quantum Wi-Fi Network, entities must provision a Q-Spot access point which conforms to Network standards. Providers participate in the Proof of Coverage process *[Section 5.2]* to prove that they are continuously providing wireless network coverage that is accessible to Subscribers in the device's local area. Providers join the Quantum Wi-Fi Network with an initial *Affinity Score [Section 5.2.6]* that diminishes if they [a] receive negative User ratings, or [b] if connection quality declines.

4.1.3 Types of Wi-Fi Providers

Figure (i) Micro Wi-Fi Provider

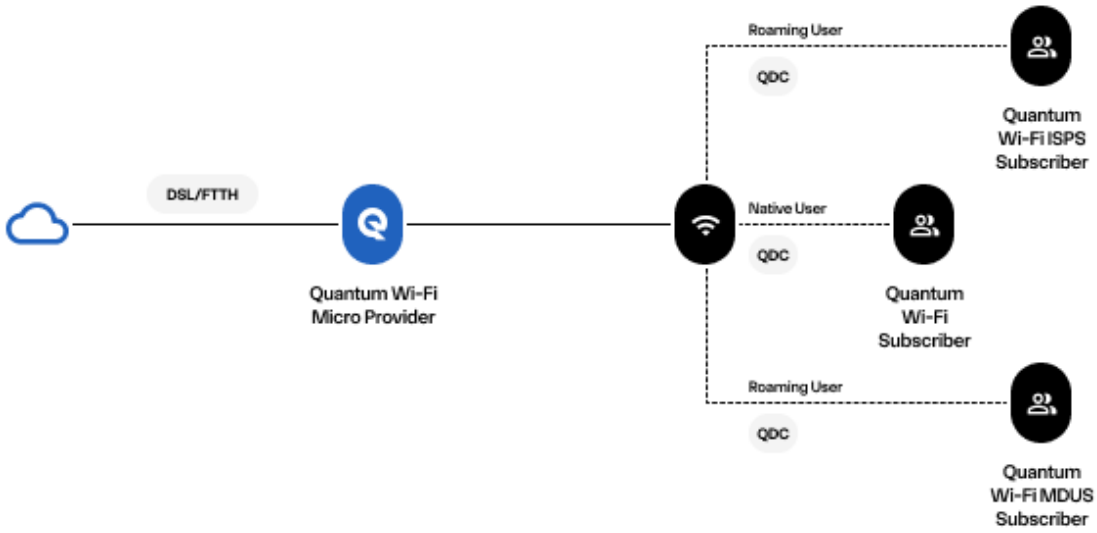


Figure (ii) MDU Wi-Fi Provider

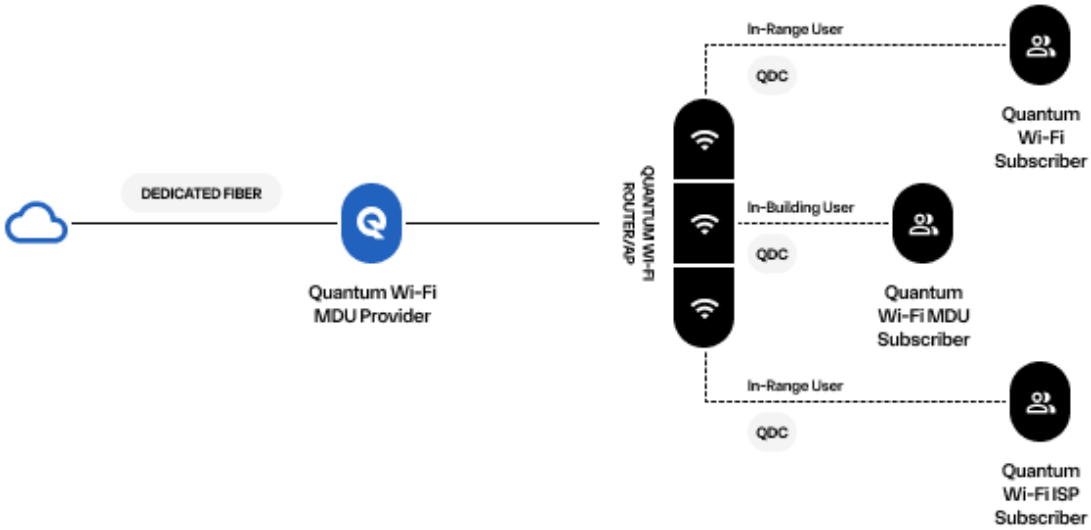
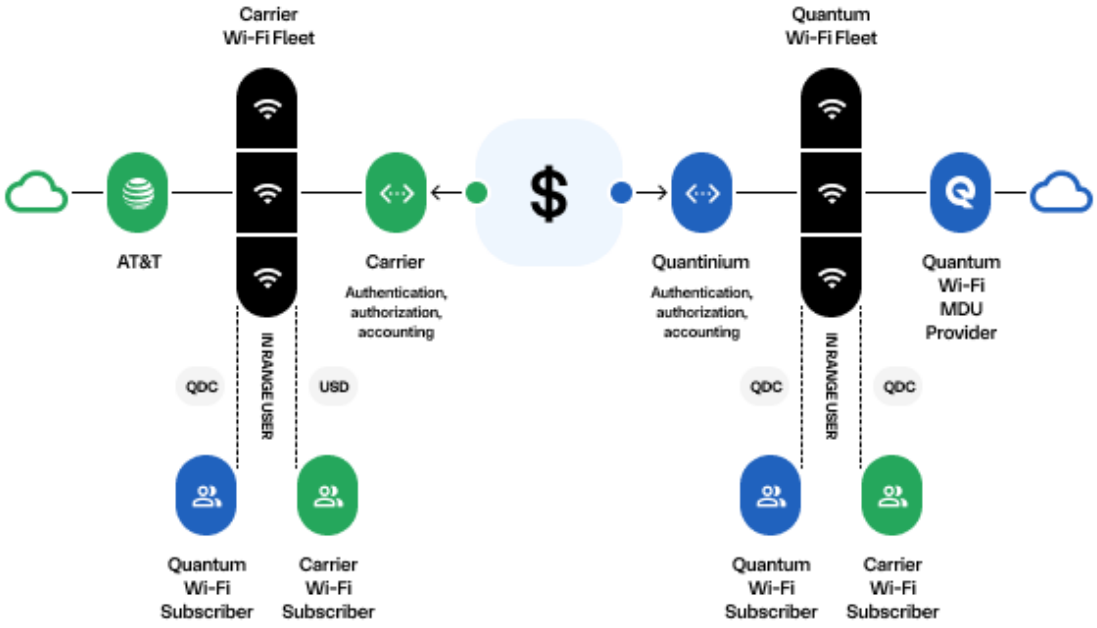


Figure (iii) Telco Wi-Fi Provider



4.2 Software Defined Wireless Access Network [SD-WAN]

The Quantum Wi-Fi Network is a software defined wireless network [SD-WAN]; a paradigm that separates the control and data forwarding planes. This separation allows for quicker provisioning and configuration of network connections. Quantum Wi-Fi engineers both traffic and network behavior in an automated, but centralized way, without requiring independent assessment and configuring of network infrastructure. This approach decouples the system that makes decisions about where traffic is sent from the underlying system that forwards traffic to the selected destination. Among other advantages, this simplifies networking as well as the deployment of new protocols and applications; thereby enabling greater flexibility on traffic and devices, which is more efficient than legacy infrastructure.

In this architecture, intelligence is centralized in software-based controllers, which have a global view of the network and are capable of controlling, in a vendor-independent way, the network devices. These network devices are no longer required to implement and understand many different network protocols standards. Instead, they can provide functionality by accepting instructions from SDN controllers. This saves time and resources, as the network behavior can be easily managed by programming it in the centralized controllers rather than using custom configurations in many different devices scattered across the network.

4.3 Wi-Fi Protocol [IEEE 802.11]

Wi-Fi is a wireless networking technology designed to allow compatible devices such as laptops and mobile phones to interface with TCP/IP networks such as the internet. Wi-Fi allows these devices to exchange information with one another, creating a heterogeneous and interconnected wireless network. Authentication with the wireless network uses modern public key encryption and NIST, AES P-256, ECC key pairs, wherein the public encryption keys for all members are stored in the blockchain. On the technical side, the IEEE 802.11 standard defines the protocols that enable communications with current Wi-Fi enabled wireless devices, including wireless routers and wireless access points. Wireless access points support different IEEE standards, wherein each standard is an amendment that is ratified over time. These standards operate on varying frequencies, deliver different bandwidths, and support different numbers of channels.

The modulation format is simple, widely supported, easy to implement, and has excellent resistance to radio frequency [rf] noise. Additionally, there are dozens of high volume vendors implementing radio transceivers compatible with Wi-Fi, including Texas Instruments, Broadcom, MediaTEK, Intel Corporation and Qualcomm Technologies, respectively. Wi-Fi supports several data rates, channel bandwidths, and error-correction techniques. Q-Spots and Subscribers dynamically negotiate the combination of these options using a signaling packet delivered at the lowest bandwidth and symbol rate to ensure maximum range for the initial communication.

4.6 Quantinium Blockchain

The exponential growth of data exchange across open networks has created a pressing need for robust security measures to ensure confidentiality and prevent unauthorized access to transmitted content. One widely adopted solution is the implementation of data protection protocols, which safeguard digital assets. These protocols involve algorithms that modify data, such as text, images, or sound, making them unreadable, invisible, or impenetrable during transmission. Data protection plays a vital role in the backend architecture of web applications, and various methods have been developed to fortify the security and confidentiality of sensitive data.

The Quantinium blockchain is a custom-tailored ledger optimized to support a secure decentralized communications network, store immutable data, and facilitate anonymous transactions. Operating as an immutable and append-only list of transactions, the blockchain achieves consensus through the utilization of the Quantinium Consensus Protocol [Section 8.3]. The distributed ledger is accessible to both internal and external users of the network, with a specific focus on Quantum Wi-Fi.

Multiple event and transaction types exist within the system, as outlined in [Section 7]. Proof of Coverage [Section 5] holds crucial significance for the network's functionality, requiring Providers to submit proofs at predetermined intervals. Each Provider is assigned an affinity score, which gradually diminishes over time. Negative user ratings, service quality deterioration, or interruptions during scheduled checkups can temporarily reduce the affinity score. Conversely, positive ratings and the timely submission of scheduled Proofs of Coverage to the blockchain boost the score.

At the commencement of each epoch, a Consensus Group comprising the highest-scoring validators is elected. Transactions are submitted to the Consensus Group for inclusion in the Quantinium blockchain. The Consensus Group is responsible for determining the validity and order of transactions, assembling them into blocks, and appending them to the blockchain. Once this process is complete, Consensus Group members receive the block reward in addition to transaction fees. As the Consensus Group validates transactions without requiring an associated block-proof beyond a threshold signature, settlement times are virtually eliminated, and transaction throughput is exceptionally high. A comprehensive outline of the Quantum Wi-Fi Consensus Protocol can be found in [Section 8.3].

4.7 Q-Spots

Q-Spots are existing wireless network devices owned and operated by Providers which create Wi-Fi coverage in local areas and transmit data back and forth between the internet and Subscribers on the Quantum Wi-Fi Network. Q-Spots process blockchain transactions and create Proofs of Coverage for the Quantum Wi-Fi Network *[Section 5.2]*. Q-Spots connect to the internet using upstream provider technologies, such as ADSL, VDSL, DOCSYS, GPON, MPLS, 4G, 5G/LTE, VSAT, and DIA.

The Quantum Wi-Fi Network is compatible with IEEE 802.11 [*a, b, g, n, ac and ax*] wireless protocols, featuring long-range, Wi-Fi coverage suitable for use with open-standard equipment. ***Q-Spots proliferate through the reconfiguration of existing non-proprietary hardware, which is already distributed globally in hundreds of millions of locations, in order to provide Wi-Fi access to individuals and corporations who obtain it for private or commercial use.***

This OEM and service carrier agnostic *Proof of Coverage* protocol, combined with a method of encryption that does not require a physical ECC chip, bypasses the oft-cited bottleneck of hardware production and distribution, as well as the excessive cost of entry necessary to mine cryptocurrencies in traditional blockchain models. Moreover, each Q-Spot can

support a multiplicity of different connected devices, and provide coverage over large areas, especially when employing best practices for installation or augmentation. Q-Spots require an IPv4 or IPv6 IP address to obtain accurate geo-location information. This is used in conjunction with other techniques to verify that a Q-Spots is providing wireless network coverage in the location it claims. These mechanisms are described in more detail in *[Section 5]*.

V. Proofs on the Quantinium Blockchain

Because the Quantum Wi-Fi Network issues rewards for providing Wi-Fi coverage and derives its income model squarely from Subscriber payments and, by proxy, Subscriber network satisfaction, it is imperative that the integrity of the network is maintained carefully and judiciously. To achieve this, the Quantum Wi-Fi Network requires its Providers to submit regularly scheduled Proofs of Coverage to demonstrate that they are providing Wi-Fi access to their local area. The proofs used in the blockchain must be resistant to Sybil attacks in which dishonest Providers create pseudonymous identities and use them to subvert the Quantum Wi-Fi Network in order to gain access to block rewards to which they should not be entitled. The network must also be resistant to Alternate Reality Attacks, which exist when a dishonest group of Providers is able to artificially simulate wireless network coverage in the physical world. An example of this attack would include utilizing Mining software from a single computer and spoofing geo-location and Wi-Fi networking. These types of attacks are ineffective against the Quantum Wi-Fi Network for reasons outlined in the sections below.

5.1 Proof Models

Proof of Work and *Proof of Stake* are the two most common consensus mechanisms used by existing cryptocurrencies to verify new transactions, add them to the blockchain, and create new protocol tokens.

Proof of Work is the original cryptocurrency consensus mechanism, first developed by Bitcoin in 2008, and enjoying the highest popularity in the cryptocurrency market, as judged by total market cap. These blockchains are secured and verified by physical miners around the world who use computer hardware in a race to solve complex mathematical equations assigned by the network. Those who solve the equation in a timely manner enter a lottery to successfully receive authorization to update the ledger with the latest verified transactions, and are rewarded by the network with a predetermined amount of digital currency. Because the difficulty of solving the puzzle is so substantive, counterfeiting the solution requires the same computational strength as a valid miner, rendering fraudulent mining activity economically infeasible.

Though undoubtedly revolutionary when it was introduced, the Proof of Work model on which subsequent systems were built have proven to be cumbersome, inefficient, and unsuitable for scale in the emerging economy. The mining process itself is extremely wasteful, as the computational work required to complete the algorithmic puzzle is energy intensive and requires significant physical hardware to complete. The entirety of this work serves no additional purpose, and is therefore meaningless and thrown away once the cryptocurrency is mine. Worse, the vast majority of computational expenditures do not even produce a mining reward since only a small number of miners are elected to their consensus group.

This is all to say that *Proof of Work* models serve no measurable or proportional real-world function and that they deliberately waste tremendous resources in the myopic pursuit of a decentralized model. This has been extensively cited as frivolous and unsustainable, however novel it may have been at the time of its inception. As such, the necessity to create a new, viable, scalable model is crucial to the continued success of blockchain technology.

5.2 Proof of Coverage

Proof of Coverage is a new validation model that allows Providers to prove they are providing coverage to a specific physical area and gain consensus on the blockchain when the authenticity of that coverage is challenged. For the Quantum Wi-Fi network, a Provider asserts that Wi-Fi indeed exists at a specific location and then convinces a Challenger that it was created according to protocol. When constructing a *Proof of Coverage* we aim to solve for the following:

i. Verify that Providers are operating a Q-Spot and that it complies to Network standards.

ii. Verify that Providers are located in their claimed geographic location.
iii. Resolve conflicting information when there is a Challenge.

5.2.1 Precepts

With the *Proof of Coverage* protocol, we aim to construct a dataset that takes advantage of the following characteristics of Wi-Fi communication:

i. **Convenience:** The nature of our network allows Subscribers to access the internet from any Q-spot available on the locator feature of the Q-App.

ii. **Deployment:** Initial setup of a Quantinium Provider requires only an individual's existing Wi-Fi equipment and the free auto-configuration application.

iii. **Mobility:** With the ubiquitous emergence of public wireless networks, Subscribers can access the internet in widespread and diverse coverage areas.

iv. **Productivity:** Subscribers connected to the Quantum Wi-Fi Network can maintain uninterrupted connection with the network as they move or travel.

5.2.2 Construction

It is important to recognize that early propagation of the network involves hundreds of thousands of Providers which will be first actors in their geographic area. Because of Wi-Fi's limited range, it is unfeasible to utilize Device to Device trilateralization as an initial protocol to establish geographic location, as a nominal percentage of first actors will be geographically isolated until the network reaches ideal density. As such, these devices must be geo-located and validated individually, with checks and balances in place to maintain the integrity of the network against bad actors. We construct the initial *Proof of Coverage* as follows:

i. Upon initial setup, QuantumWALLET acquires GPS data along with other relevant information, including speed, latency, and jitter during the Provider auto-configuration process.
ii. A Provider's location is queried from the local Internet Service Provider to extract GEO-IP data.
iii. As Subscribers connect to a Q-Spot, a GPS report is generated to revalidate the Provider's location.

5.2.3 Verification

Our goal is to verify the physical geo-location of Providers on the Quantum Wi-Fi Network via GPS, GEO-IP and latency data from both the Provider and Subscribers. We verify the Proof of Coverage as follows:

i. The provider's location is required from their Internet Service Provider to verify GEO-IP data.
ii. The Quantum Wi-Fi Network utilizes a Latency Trilateration algorithm to confirm Provider's location.
iii. A WLAN fingerprint is generated using authenticated devices on the Provider's local network upon initial setup and is reconfirmed upon a challenge event to verify Provider's location has not changed.

By auditing the above steps the network can automatically prove [or disprove] the Provider's location and ensure network performance is within established guidelines.

5.2.4 *Auditing*

Since the fiscal benefits of Quantinium mining may be substantial at scale, security protocols which protect the integrity of the Quantum Wi-Fi Network and its processes must likewise be substantive and efficacious. One of the key components of our security protocol includes the creation of a network of users incentivized to report illicit behavior. The protocol is as follows:

i. Subscribers re-validate Q-Spots every time there is a connection, and its geo-location is verified against its registered IP/GPS derived location.
ii. Should a Subscriber report a Provider's location as illegitimate, the Quantum Wi-Fi Network issues the Q-Spot a formal warrant. The location falls off the available Q-Spot list, and is marked as having a warrant in a new tab inside the Quantinium Wallet application.
iii. Should the investigation prove the Q-Spot illegitimate, the Q-Spot falls off of the Network entirely and the Provider must stake QTI if they want the spot to be reestablished. If a second warrant is issued for the same Q-spot and it again proves illegitimate, the Provider loses their staked token.
iv. The majority of this staked coin is paid as a bounty directly to the individual who validated the inauthentic Q-spot.
v. For a Provider to re-establish their Device after two failures within a certain period, they will need to re-stake double the amount of coin, and re-register the device. This can be repeated a third time, at a triple stake. Should the Provider lose three Challenges, the device is blacklisted permanently.

Because the QTI amount received by a Challenger is slightly less than the amount of money staked for a Mining spot, a pseudo-Sybil attack wherein fake Providers are created for the sole purpose of challenging them, is cost-prohibitive.

To prevent Providers from being inappropriately penalized for inability to provide coverage during a power outage or for ISP related issues, the Quantum Wi-Fi Network will use algorithms which identify outages in particular geographic areas and inoculate those areas from penalization. Additionally, the initial "free" challenge is reset once annually, to prevent accidental penalization. Once the Network achieves density, we hope to use these metrics in the more general sense, to assist the general population in identifying power and ISP outages without using a self-reporting system, regardless of their status in the Network. This data is invaluable to a host of companies, news outlets, governments and service providers.

5.2.5 *Dedicated Challengers*

The so-called "gig economy" has become a popular term to describe the introduction of freelance work into the labor market. This term is inextricably tied to ride-sharing services like Uber, package delivery services like Amazon, food delivery services like DoorDash, and online micro-services like Fiverr. Recently, an attempt has been made to "appify" virtually every aspect of the economy, a movement which has proven fruitful, if not occasionally superfluous. That said, the fact that such a large demand for additional services is thriving, and that there is a large and eager labor force ready to provide them, provides opportunities for these individuals to assist Quantinium in maintaining its network standards.

We imagine the creation of a new class of Quantinium members, *Dedicated Challengers* to function, in practice, as follows:

i. As the proliferation of Providers rises, the demand for Subscribers of good standing to execute validations on existing warrants will also proportionally rise.
ii. Within the Quantinium Wallet network map, a separate tab will display a scalable map containing all existing warrants within the User's immediate geographical location.
iii. Users who want to take an active role in obtaining QTI are able to commute to a generalized area marked on their map to execute the warrant on a potentially illegitimate Q-Spot.
iv. Dedicated Challengers use their cellular phone [or if desired, a different device] to attempt to connect to the Q-Spot, which should be broadcasting according to their geo-location in a particular area.
v. If the Provider passes the challenge, a very small reward is provided for the Challenger, paid in QTI for their service. If the Provider fails the challenge, the larger reward - 75% of the Provider's staked coin, is paid to the Challenger.

Regardless of outcome, a brief window of time passes before payment is made to the Challenger to prevent fraud. We can track and audit Challengers by fingerprinting their activity to make sure their challenge results are in keeping with a range similar to that of other Dedicated Challengers.

5.2.6 *Affinity Scores*

We establish Provider scores based on a multitude of factors related to the performance of the Provider and Validator in order to ensure that the best possible service is being provided to Subscribers. This Provider and Validator score is known as its *Affinity Score* and represents a combination of Q-Spot performance metrics and user ratings and experience.

i. Initial Affinity Score is established based on performance tests which are executed upon setup and at regularly scheduled intervals.
ii. Additionally, a Subscriber scoring model based on quality of connection and speed will affect the Affinity Score, either improving or decaying the existing score based on input. These Subscriber scores operate in a similar way to a credit score, wherein a negative mark is initially more damaging to the Provider but tapers and falls off over the course of several months. This prevents competing Providers and Validator or temporary outages and slowdowns from permanently affecting the score of a Provider and Validator who is providing service effectively.
iii. Subscribers also confirm a Provider's location automatically upon connection, and place a bounty on rogue access points if they are found to be fraudulent, missing, or moved.

VI. Transactions

6.1 Transactions

Blockchain transactions on the Quantinium ledger provide functionality that enables peer-to-peer transfers of protocol tokens similar to many existing blockchains, but which also provides a set of parameters that enable core functionality that is critical to the operation of the Quantum Wi-Fi Network.

6.1.1 *Subscription Model*

Subscribers using the Quantum Wi-Fi Network to send and receive data from the internet must pay a subscription fee. This fee compensates the Provider delivering data between the Subscriber and the internet, and is unrelated to the transaction fee that Providers earn for mining transactions as part of blocks that are recorded to the blockchain. This fee is determined by Oracles via smart contract based on the country of origin and upstream bandwidth provider pricing.

An example subscription process is as follows:

i. Data is exchanged between Provider and Subscriber.
ii. Provider transmits data to and from the internet.
iii. Oracles establish the cost per Mb of internet data via Least Cost Routing algorithms.
iv. Data costs and all corresponding transactions are inserted into the Blockchain.

The goal of the Quantum Wi-Fi Network is to offer an internet service that is significantly more cost-effective than any competing service currently available, without sacrificing speed, reliability, or security.

6.2 Quantinium Fees

Every transaction published to the blockchain imposes a certain cost on the Network which is required to download and verify it. Certain transaction fees are necessary as part of a larger regulatory mechanism to prevent abuse. In this section we outline the types of fees needed on the Quantum Wi-Fi Network, and propose solutions that take advantage of the unique characteristics of the Quantum Wi-Fi Consensus Protocol *[Section 8]*.

6.2.1 *Transaction Fees*

The default approach used by most cryptocurrencies is a voluntary transaction fee, which relies on miners to act as gatekeepers and set dynamic transaction minimums. This approach has been received favorably in the cryptocurrency community particularly due to its inherent "market-driven" economics, which allows supply and demand fundamentals to determine fees. This approach, however, can be problematic as transaction processing is not a true free market.

In reality, every transaction a validator includes in a new block requires the participation of every node in the network. This means the majority cost for transaction processing is borne by third parties and not the validator that is making the decision of whether or not to include it. Hence, a *Tragedy-of-the-Commons* problem ensues and is a key hurdle in the scalability of most cryptocurrency platforms.

To solve this issue in the Quantinium model, Oracles connect to external algorithms and dynamically adjust global transaction fees in accordance with "market-driven" economics and fee structures are set as a nominal fixed percentage of the transaction.

6.2.2 Staking Fees

The Quantum Wi-Fi Network reaches maximum benefit when the density of Users in a specific location is high. This statistic will usually, but not always be related to population density, which typically determines Wi-Fi demand. Intentionally propagating Q-Spots near the ideal network density may be cheaper than coincidental separation, but overpopulating a network by stacking units in a limited spatial radius [such as setting up a warehouse full of equipment in a location where demand is not pronounced] would be cost-prohibitive. This scaling reward to density algorithm removes Provider incentives for Q-Spot deployments that are not proportionally beneficial to the Network. It is important to note that equipment can be purchased or reasserted for a new location, however, it will be necessary to pay a new staking fee to do so.

VII. Quantum Consensus Protocol

7.1 Shortfalls of Existing Protocols

The main appeal to the *Proof of Work* model seems to be its mitigation of pseudo-spoofing [Sybil] attacks upon a network's protocol infrastructure. Since *Proof of Work* models require an extensive amount of computer hardware, time, and power to solve the algorithmic puzzles, attacks of this sort become too expensive to generate fraudulent profit. This has proven fundamental to the mainstream adoption of blockchain technology as a whole, but in practice, has several downsides; chief among which, is profligate power consumption. It is estimated that the Bitcoin network consumes more power than many small countries [13], and expends more than 7x the energy of Google's global footprint.

Concurrent to this issue, many blockchains networks have created mining pools where users band together to mine a single block and list the pool's address as the party to receive the reward. The pool then shares the block reward with the members of the pool, nullifying many of the advantages of decentralization and squeezing out independent miners. Both Bitcoin and Ethereum have come to be dominated by a very small number of mining pools[1]; ceding control of their consensus protocol to fewer and fewer entities.

To state the obvious, the very mechanism which makes the *Proof of Work* model difficult to falsify, also makes the protocol inefficient and unscalable. Moreover, the real-world adoption of this protocol has produced a re-centralization in praxis which marginalizes the primary goals of the system itself. For this reason, a new protocol must be introduced to replace the *Proof of Work* model.

[1]Source: https://coin.dance/blocks

7.2 Quantinium's Protocol Precepts

The following represent ideal attributes in a new consensus protocol.

7.2.1 *Asynchronous Byzantine Fault Tolerant*

The protocol must be tolerant of Byzantine failures so consensus can still be reached even if a threshold of nodes is acting dishonestly.

7.2.2 *Perpetual Decentralization*

Network consensus must be designed so it is impossible for independent entities to form Mining pools which centralize the network and cede control to fewer Consensus Groups. It must also prevent Providers from concentrating equipment in small geographic areas, by making it cost-prohibitive to do so. In this regard specifically, the Quantum Wi-Fi Network is particularly protected, since mining rewards are self-limited by reduction in Subscriber interaction with each individual Router. Should Provider density exceed Subscriber demand, the Provider will receive fewer rewards, encouraging even geographic distribution.

7.2.3 *Centrally Permissioned*

Many cryptocurrencies lay claim to permissionless networks while heavily regulating access to certain resources or cultivating mining pools which concentrate the selection of Consensus groups into small circles. This creates the appearance of permissionless protocols while nullifying them in practice. Quantinium strikes this balance pragmatically rather than ideologically, utilizing a hybrid model where the functions of the network are permissioned by the Quantum Wi-Fi Network, but where the blockchain is completely permissionless and fully autonomous.

7.2.4 *Network Purpose*

The consensus protocol performs a secondary purpose beyond securing the blockchain ledger, and utilizes the system to achieve meaningful, productive, profitable work which satisfies an economic and social demand shared by billions of users, namely, connectivity to the internet.

7.2.5 *High Throughput*

The Quantinium blockchain can scale and handle high-throughput in a post-quantum encrypted setting, so that Subscribers, Providers and Validators don't experience long wait times when interacting with our ledger.

7.3 Quantum Consensus Protocol

QCP is a permissionless, high-throughput, post-quantum secure blockchain combining an Asynchronous Byzantine Fault-tolerant Protocol [ABFT] with proprietary *Proof of Coverage* and associated verifications and checks. Because of the intrinsic security of our proprietary encryption protocol, the Quantum Wi-Fi Network is able to keep transaction throughput exceptionally high, without sacrificing security.

7.3.1 *The Consensus Group*

In accordance with most distributed ledgers, Quantinium elects a group of users into Consensus Groups at given intervals, who are responsible for creating blocks and appending them to the ledger. The Consensus Group is selected by aggregating Validators with the highest Affinity Scores *[Section 5.2.6]*. These Validators must be compliant to the Network's standards, and must have no recent outstanding bounties. This block creation process is incentivized through the issuance of rewards, which are paid in conjunction with the sum of all transaction fees contained within the block. Rewards are paid in QTI and are split among members of the Consensus Group once the block is approved and written to the blockchain. In the unusual case that no transactions occur during a particular epoch, the empty blocks are appended to the blockchain, and the process ends.

VIII. Advertising

8.0 Context

The advent and rapid adoption of online shopping has resulted in the large-scale disruption of local economies, and undesirable financial and societal outcomes for millions of businesses and local retailers. Centralization of purchases in the online marketplace directly coincides with a concurrent centralization of advertising dollars spent online, and a rapid and proportional *decline* in the effectiveness of advertising in all other mediums. To make matters worse, approximately half of all online advertising dollars spent globally go to just two companies [17]. These companies increasingly control the flow of data online, and have come under continuous governmental scrutiny for violating user privacy, failing to protect user accounts from hacking, and selling user data to third parties.

The downstream effects of these trends are worth mentioning. Lack of locally anchored pricing, the intrinsic wage disparity of emerging vs developing economies, and the uneven distribution of profits through the supply chain have led to the wholesale abandonment of local manufacturing worldwide. This phenomenon results in the systematic export of local capital and a mean reduction in locally produced wages as the importation of cheap products manufactured abroad undercuts the pricing of locally produced goods. Coupled with a rise in real estate costs, employee wages and overhead costs, local retail stores struggle to make offerings to local customers with substantial benefits vs their cheaper online counterparts.

That is, a convergence of structural changes in the economy have uniquely crippled local economies, curbing customer demand, reducing the effectiveness of advertising, and shrinking advertising budgets simultaneously. Perhaps more importantly, they have fundamentally altered consumer behavior, a facet of the economy that is notoriously slow to develop and difficult to course correct.

Solving these issues requires a multipronged approach to privacy and advertising which matches for the simplicity of creating online marketing campaigns, but also neither centralizes revenue, nor monopolizes the control of data. Moreover, providing an intrinsic advantage to brick and mortar shopping locations should be a platform imperative, as this market segment has largely been sidelined by online retailers. In this sense, Quantum Advertising has a native advantage vs the largest advertising platforms, namely, that it has access directly to the routers providing internet service, providing essential real-time geolocation data that can be used to customize advertising and shape user behaviors.

8.1 DNS Redirection

The digital advertising landscape has undergone a dramatic transformation in recent years, with advancements in technology allowing for more targeted and personalized campaigns. One such innovation is *Domain Name System* [DNS] redirection. By leveraging DNS authority and redirecting traffic, advertisers can now deliver custom advertising content to users based on their device preferences, geolocation, and specific settings. This approach not only benefits advertisers through increased conversion rates, but also enhances the user experience and promotes the success of local businesses.

DNS is the proverbial backbone of the internet, directly responsible for translating domain names into IP addresses. DNS redirection is a technique that enables advertisers to modify the DNS resolution process, redirecting users to specific destinations when they attempt to access websites or services. This redirection can be leveraged to seamlessly integrate custom advertising into the browsing experience, replacing generic ads with more relevant and localized content seamlessly.

Through the reconfiguration process of the Quantinium mobile application, Quantum Wi-Fi assumes DNS authority over the newly reconfigured Wi-Fi Router and access point. Consequently, when Quantum Wi-Fi subscribers make use of these enhanced Q-spots, they receive advertising content from the Quantum Advertising [Q-Ads] marketplace instead of other advertisers' servers. This enables Q-Ads to seamlessly incorporate tailored advertisements to subscribers, taking into account device preferences, geolocation, and Q-spot settings. As a result, advertising is effectively re-localized, delivering advantages to both brick-and-mortar retail businesses and to local subscribers.

8.2 Advertising Proximity Bidding

The Q-Ads platform resembles the bidding formula of traditional search and social media advertising platforms, except that additional precedence and pricing is given to a particular organization based on distance to their geographic location. These organizations will be given a distance to price range expressed as tiered levels from the epicenter of a given location and must bid on impressions in the marketplace. The further a Subscriber is from a Q-spot epicenter, the higher the advertisement cost to reach that Subscriber, since preference is given to a business that is closer to Subscriber proximity. That is, the goal is to have local businesses benefit sharply from their physical location, but a business with a low bid for a close location, will ultimately lose an advertising spot to a further location with a larger bid per impression.

This bidding process results in significantly more conversions for local businesses, and reduces the amount of wasteful advertising spent on customers who have no intention of purchasing a particular product, since it is beyond their immediate location. In traditional search or social media advertising, an algorithm must connect an advertisement to a user based on guesswork about the interests of that user. This guesswork is sometimes laughably inaccurate, but even in instances when advertising is accurately targeted, there is no guarantee that the advertising effort is successful. Research suggests 70-80% of internet users ignore sponsored search results [Search Engine Land], and approximately 81% of all online shopping carts are abandoned [SalesCycle].

Since traditional algorithmic pairing is responsive, a user may purchase a searched item, continue to perform research on the product afterwards, and therefore be paired with additional advertising for that same product despite the fact that they are no longer in the market for the purchase. Every dollar spent advertising that category of product going forward is wasted, and there is no conciliatory chance of a secondary or tertiary product purchase since a redundant ad won't be clicked at all. Ultimately this means the great mass of advertising protocols multiply waste at each stage of the marketing process online, with no recursive scaffolding to prevent further losses.

Q-Ads sidesteps this issue entirely by recreating the environment of physical signage in the digital space. The router forms a concentric parameter of broadcasted digital advertising the same way physical signage works with line of sight. As a result the target audience is always available for purchase, interest is based on immediate proximity and pairing, and advertising ends abruptly when they have left the parameter. These unique facets of the platform establish a higher baseline rate of conversion, and ensure that advertising on the Quantum Wi-Fi network becomes a mainstay of small businesses and strategic campaigns by advertising companies.

8.3 Quantum Wi-Fi Subscriber Behaviors

Most advertising values on the platform are expressed as a distance to price ratio, but the preference of our platform to a particular bid may also be affected by user behaviors. Quantum Advertising uses proprietary algorithms to privately log and predict device preferences to customize suggestions. All user device data is hashed, invisible to the public, and is stored securely on the blockchain. To further maintain user privacy the platform also utilizes a unique “fog of war” gatekeeping system that quarantines customer data based on location and the output of nearby Q-spots.

For example, if the database shows that a user device prefers to drink coffee several times per week, but is not within the proximity of any local coffee shops, then this data point is guarded and inaccessible by all parties since that information is not relevant to any relevant local Q-spots. However, if the same user device comes within the proximity of a Q-spot within a coffee shop, that coffee shop’s Router pings the device to query against the individual user data to see if the device frequents coffee shops. If there is a behavior match, advertising commences to the device, if there is no match to the inquiry, no additional data is transmitted about the user and the channel is closed. If a user enters into a coffee shop for the first time, the interaction is logged unidirectionally for future interactions. In this way, no information about the user device is revealed except that which is absolutely relevant to the business attached to the router.

8.4 Advertising Revenue Sharing

While Quantum Wi-Fi’s primary business is a paid access service, many brick and mortar businesses provide internet service free of charge in order to attract more customers and generate additional sales. Free Wi-Fi service operates as a loss leader for those organizations and switching to a paid version of service is unfeasible for a multiplicity of reasons. Because Quantum Wi-Fi is capable of producing advertising revenue from traffic that occurs via updated routers,

businesses now have a unique method of maintaining free service, while also turning these loss leaders into profit centers.

In the settings tab of their Q-wallet, equipment owners may select either to charge customers for Wi-Fi service, or to make that service free in accordance with local data costs. With either setting, the equipment owner retains a portion of the ad revenue produced through their routers. The insertion of localized advertising is seamless and invisible, and user experience is amplified by ad specificity. It is worth noting that ad revenue is shared with all Q-spot owners, regardless of whether the equipment is owned by a business or an individual. If a router is privately owned and in a local residence, where proximity to a product or service is irrelevant, then the router will either produce revenue through the bids of other local businesses, or the bids of online retailers, whichever is higher. This ad revenue is significant in that even a router with limited paid user interactions will produce some income for its owner, reducing the cost of internet service or producing revenue for router owners across the board.

8.5 Quantum Wi-Fi Subscriber Privacy

Quantinium does not believe in sharing, distributing, or selling user data for any reason, and has placed decentralized privacy measures in place that preclude any company from accessing device or user data improperly. The information obtained through our advertising platform is internally private, hashed, and encrypted, both on and off the blockchain. Q-Ads utilizes a “blind” data collection process, and this process extends to advertisers and local business, so that no User data can ever be compromised en masse.

It is important to note that there is a partition of device to user which precludes the leaking of data, or the doxxing of a Subscriber as having been in possession of a particular device. Insofar as the Quantum Advertising platform is concerned, all devices are “strangers” to the router, to the Subscriber, to the Provider, and to the platform, and all interactions utilize our Fog of War query system to access each data point individually.

The ability to use just a single data point with accuracy is yet another unique and advantageous feature of localized advertising. An online retailer for example, may need a host of information about a user to advertise to them (ie. their age, sex, location, browsing habits, preferences, recently visited websites, device type, etc). Whereas our platform requires fewer data points and personal information (“a User is 100 ft from hotspot A”). These are the sorts of data points that are less likely to be perceived as intrusive by users, and more likely to be perceived as useful by advertisers.

8.6 Simplicity of Use

Approximately one third of all businesses refrain from digital marketing, citing learning curve and expense as primary contributing factors. The process for initiating online marketing campaigns is often needlessly complex, requiring significant hiring assets or third party expenditures for setup and monitoring. Moreover, scaling or shifting messaging or offerings can be demanding of time and capital, and these costs multiply when the campaign does not produce adequate returns.

Quantinium’s online advertising platform encourages web-resistant local businesses to enter the online advertising field by promising amateur level ease of use, faster setup times, automatic pricing and budgeting, and simple campaign execution and cessation. If a local business wants to scale up their advertising, they can simply increase the bid cost at range, extending their reach into Grey Zone common areas. Additionally, the Q-Ads platform may provide opportunities to “boost” range with one button and at reduced prices when no bids exist on a common area. This is the sort of easy and on the fly user experience that lends advertisers to increase ad spend, and which also ensures solid return for underutilized routers in the network. Lastly, extra range may be given to Q-spots that pair well with user device preferences. These pairings will be listed in simple terms for businesses to select as their router preference, and will reach customers at an increased range.

8.7 Zone Types and Conflicts

Quantinium realizes that the unfortunate and singular goal of most major advertising platforms is maximal monetization of ad space regardless of extemporaneous factors. This has however, led to widespread abuses and corporate bid bullying, resulting in a large restive segment of the business community. The Q-Ads market addresses these issues

through the establishment of ad islands or “spheres of influence” which are exclusive to the immediate area of a particular business.

8.7.1 Spheres of Influence (Advertising Zones)

Proximity based advertising is significantly easier to visualize and organize than algorithm based advertising. In the Q-Ads platform, advertisers and business owners will be able to access and view a local map of their registered addresses with clearly marked visual representations of both the areas they control, and the areas where they can reach new customers. Each of these locations is organized into constellations of influence that can be bid on separately, or simply adjusted via a sliding scale of bid and distance from the central address.

A *Blue Zone* encompasses the approximate property limits for brick and mortar businesses and the immediate common areas surrounding them, with preference for the location until an equidistant sphere of influence is met from another Blue Zone. So long as they are registered with the Q-Ads platform and have an open campaign, 100% of all website traffic in the Blue Zone will work on behalf of that business. If a business’ own ad campaign is not active in their respective Blue Zone, then the surrounding routers will be open to bids from other businesses, and the routers will produce advertising revenue for the equipment owner.

Grey Zones are common areas that extend beyond the immediate range of a particular business. These zones include Wi-Fi serviced areas that are not in the immediate proximity of a particular business, or are located in the Blue Zone of a business that is not performing advertising for themselves, and/or that is focused on gathering revenue from the advertising of other businesses.

Finally, a *Gold Zone* is an area of high traffic, in a common area that would be highly contested by multiple brick and mortar stores and whose traffic is maximally valuable. An example might be the common areas of a mall or an airport terminal, where the customer base is poised to make purchases, where multiple retail outlets share a proximal space, and where targeting based on preferences and bidding is more desirable. In these cases, the routers of individual stores operate on an island, but no preference is given for proximity.

The Q-Ads platform also allows for customization of campaign instances. In the example of our coffee shop, a standard advertising campaign would extend beyond their blue area into the immediate common (or “Gray” Areas) to attract more customers, but when a customer is sitting in their coffee shop, they would receive advertisements for other businesses, producing revenue that offsets connectivity and advertising costs, or produces profits.

IX. Software

9.1 Quantum Wallet

Quantum Wallet (Q-Wallet) is an advanced cryptocurrency wallet engineered to provide unparalleled security for digital assets, user data, and identity. Designed as a custodial application for both Android and iOS, Q-Wallet caters to all levels of cryptocurrency users, seamlessly integrating industry-leading safeguards with an intuitive, user-centric experience.

The wallet employs best-in-class user experience principles to ensure effortless onboarding, guiding beginners through their first transactions with in-app walkthroughs and comprehensive user guides. Meanwhile, seasoned crypto enthusiasts will appreciate substantial enhancements to core functionalities, including superior backup recovery mechanisms and optimized transaction processes.

At launch, Quantum Wallet will support a diverse range of cryptocurrencies, including Quantinium (QTI), Bitcoin (BTC), Ethereum (ETH), Tether (USDT), USD Coin (USDC), Solana (SOL), Dogecoin (DOGE), Avalanche (AVAX), Litecoin (LTC), Bitcoin Cash (BCH), Cardano (ADA), Polygon (MATIC), and Cosmos (ATOM)—with additional token integrations to follow in subsequent updates.

9.1.1 QuantumPAY [Q-Pay]

Located within the Quantinium Wallet application, QuantumPAY is a function for sending and receiving Quantinium and other currencies peer-to-peer, direct from a smartphone. Users can enter a username, select an amount, and confirm to send, or they can use a proximity detection system like NFC Tap for tipping and incidentals. Users can also request money via comment or invoice, with an exchange tracker that gives them the current USD [or its equivalent in the country of origin] for reference. This simple transfer system is the first step in making Quantinium a household name for use in common payments.

i. **Deficiencies of Cryptocurrency Payment Methods:** It would be difficult to discuss the future of cryptocurrency without mentioning barriers of entry to its common use. While familiarity with blockchain is steadily rising, its real-world use has been relegated predominantly to financial markets, where speculation about its future dominance is invariably tied to some obscure, future, widespread adoption event.

   Unfortunately, no such adoption has yet taken place. While trading and ownership of cryptocurrency has become commonplace, it is difficult to find a communal exchange of goods conducted in cryptocurrency at the street level. Several blockchains are working on this problem, and a race to create crypto-ATMs, charge cards and smart contracts has finally begun to emerge. Unfortunately, these solutions take time and infrastructure to implement, and face institutional opposition, slowing their integration and ultimately relegating the existing market into cumbersome and complicated wallet to wallet exchanges.

ii. **Deficiency of traditional payment Infrastructures:** The previous decade has seen the emergence of various peer-to-peer payment systems, through centralized mechanisms, permeate the gig economy. PayPal, CashApp, Venmo, Skrill, Stipe, Square, etc. all perform the similar function of issuing private “merchant accounts” for individuals. These platforms have broad appeal, with high profitability and transaction volume in the hundreds of billions of dollars. However, since they are tied to traditional financial institutions and utilize traditional financial instruments, they also have multitudinous shortfalls, including narrow scope of use, rampant fraud, forced arbitration processes, and arbitrary terms and conditions which exclude entire industries or cause funds to be held for months without recourse, among other issues. Since they are, for lack of a better term, the “only game in town” it is unlikely that these companies will significantly alter or loosen their policies and protocols to make them more accessible.

iii. ***Solutions through QuantumPAY:*** The Q-Pay feature of the Quantinium Wallet provides a solution to users on two fronts. First, it sidesteps the interference of conventional financial institutions that would bring unfavorable terms to its consumers. Secondly, it brings cryptocurrency to Main Street, combining the security of a blockchain with the convenience of a fintech app. While large traditional companies like Pay-Pal and Zelle might point to the security of their applications by referencing their consumer guarantees, the cost of these guarantees comes in the form of friendly fraud, businesses crippled by temporary losses of accounts, frozen funds, lengthy arbitration, and related upkeep and customer service expenses. For most vendors, the trade of chargeback protocols for guaranteed payment is a welcome one, and since most of these transactions are small in nature and issued to a person of trust, the limited risk of these rogue transactions seems acceptable.

9.1.2 QuantumTRADE [Q-Trade]

QuantumTRADE is designed to be a convenient place to buy, swap and stake Quantinium coins at the best available rates, leveraging proven and audited protocols, while offering an outstanding incentive program. Liquidity Providers are generously incentivized for contributing to liquidity pools with yield rewards through swap-fee sharing and bonus yields for Liquidity Providers of selected pools.

QuantumTRADE follows a constant product formula, where the product of the quantities of two tokens remains the same before and after a swap is performed. The price slippage depends on the ratio and quantity of tokens in the pool. Q-Trade is a decentralized protocol deployed on the Quantinium blockchain. Each transaction record, such as on-chain deposits and withdrawals, are transparent on the network. QuantumTRADE is integrated with Quantinium Wallet, allowing users to exchange tokens directly in the App.

9.2 Quantum Wi-Fi Provider Application

The Quantum Wi-Fi Provider Application is engineered to streamline and enhance the operational efficiency of Wi-Fi providers, integrating seamlessly into the Quantum Wi-Fi network. One of its primary features is the ability to automatically reconfigure existing wi-fi equipment, facilitating a swift and hassle-free transition into the Quantinium ecosystem. This automation reduces downtime and ensures a seamless integration process, allowing providers to quickly leverage the benefits of advanced connectivity. Furthermore, the application offers sophisticated analytics on data usage and rewards, providing deep insights into subscriber behavior and network performance. These analytics empower providers to make data-driven decisions, optimize service delivery, and enhance subscriber satisfaction.

Beyond technical capabilities, the Quantum Wi-Fi Provider Application incorporates comprehensive business management tools, including an affiliate program management module and a state-of-the-art CRM system. These features enable providers to effectively manage partnerships, track performance metrics, and drive revenue growth. Additionally, the application includes a robust ticket system for submitting billing and technical support requests, ensuring that all provider and subscriber issues are addressed promptly and efficiently. This holistic approach to network management and business development ensures that Wi-Fi providers can maintain high levels of service quality while exploring new growth opportunities within the Quantum Wi-Fi network.

9.2.1 Q-Spot Auto-Configuration

One of the most well-established precepts of innovation is that adoption of new technologies faces three major hurdles:

i. Difficulty in integration with, or replacement of, existing technologies.
ii. Linguistic specialization which renders the new technology difficult to explain or proselytize to relevant parties.
iii. Difficulty procuring and funding infrastructure to implement that new technology.

Quantinium is unique in that it decisively avoids these pitfalls through careful engineering of the automatic provider-configuration process. This one-touch protocol confers new technology onto devices without requiring technical knowledge on behalf of the Quantinium Provider. The software automatically updates an existing access point and Router to mine Quantinium. This auto-config feature will support Ubiquiti Networks, UniFi, and Netgear routers immediately upon release, with more to follow quickly.

9.2.2 Q-Affiliate

The Quantum Wi-Fi Network recognizes that the most important KPI for Quantinium is the rapid expansion of Quantum Wi-Fi's network's infrastructure and the widespread adoption of its cryptocurrency. Experience tells us that even successful cryptocurrencies suffer most prevalently from obscurity during their introduction and benefit most markedly from colloquial familiarity in the general population.

Despite this often discussed and widely accepted facet of the cryptocurrency market, we rarely see companies venture beyond typical reliance on traditional advertising firms and organic, intra-community growth. Quantinium recognizes the need for these mechanisms in our own advertising, however, since it seems the largest barrier to widespread adoption is related to education and name recognition, we want to employ a secondary advertising method, which capitalizes on word-of-mouth adoption by incentivising users to spread the news of our Network through via affiliate marketing.

This technique activates individuals to organically proselytize the platform to their individual networks, to develop cost/benefit models for purchasing their own inorganic advertising, and to increase product penetration on social networks and in professional settings. We believe this method stays true to our culture of decentralization, encourages organic growth and continued interaction with our platform, creates intra-market awareness, ensures a higher quality of end user, accelerates user education endeavors, and establishes public familiarity of the Quantum Wi-Fi Network.

I. **Mechanisms:** The Quantum Wi-Fi Network plans to issue rewards in our native coin to reward a multiplicity of user actions which benefit the Network. These actions will be tracked via affiliate codes, which assign rewards to the referring party whenever a referred user performs the action. These rewards are held for approximately 30 days and distributed immediately thereafter to the Referrers QuantumWALLET. This time delay ensures that no temporary manipulation of protocol can result in an instantaneous reward and cash-out or transfer, and that any pending challenges to a particular Q-Spot are concluded and reviewed long before Referrer benefits are released. A Referrer receives rewards for the following actions:

   (a) Direct recruitment of a new member who downloads software and/or configures existing compatible Wi-Fi hardware and begins providing internet access for their geographic area. These rewards will be set as a fixed dollar [USD] amount irrespective of Quantinium's market price, paid in Quantinium coin [QTI], to be released after 30 days of continuous service by that Q-Spot.
   (b) Affiliates receive a small reward proportional to the mining rewards of a recruited Provider who is providing continuous internet service to the Quantum Wi-Fi Network. Provided the Q-Spot is receiving Mining rewards and stays in good standing, these rewards are recurring to the Referring party.
   (c) A small percentage of the fees collected by the Quantum Wi-Fi Network for the purchase of Quantinium by a referred party will be transferred to the referring party.

II. **User Education:** Direct Affiliates of the Quantum Wi-Fi Network may only make referrals into the platform after successfully completing several online courses designed to educate the user on various aspects of the Network, equipment, exchange function, ethos and the cryptocurrency itself. These tutorials are not designed to dive deeply into the technical aspects of the platform per se, but rather are designed to ensure that referring Users have an accurate and working knowledge of the Quantum Wi-Fi Network's key function and purpose so they are qualified to represent that information to a third party.

   Following each section of the tutorials, users will be required to complete short, question-randomized and timed multiple-choice tests to ensure they understood the content. Should they fail a particular section, they must rewatch the tutorial and retake the test until they pass with a score of 85% or higher. The larger goal of these tutorials is to increase the number of Users who actually understand Quantinium and its essential role in the greater market. By incentivising education, we produce more educators, focus corporate messaging and create an organic community of Users equipped to represent our corporation.

III. **Legal:** The Quantum Wi-Fi Network's administration recognizes that affiliate marketing is a powerful tool when correctly employed, but that abuses of its compensation structure are often exploited, used to commit fraud, or executed incorrectly by the corporations they are meant to benefit. To prevent even the appearance of these practices, the Quantum Wi-Fi Network will require all Affiliates to execute legal paperwork clearly outlining company policy and federal laws in their country, if applicable. These documents will also reference 3rd-party websites and government guidelines outlining appropriate practices in affiliate marketing and advertising, and will contain a detailed overview of compensation, structure, and expectations. Additionally, these legal documents will contain disclaimers, an income disclosure, and corporate protections. Affiliates will execute these documents via electronic signature on an internal platform, and the documents will be encrypted and stored electronically. All affiliates

must sign these documents successfully and agree to our terms and conditions prior to being approved as affiliates and receiving permission to market the Quantum Wi-Fi Network to the public.

9.2.3 *QuantumCRM [QCRM]*

Affiliates of the Quantum Wi-Fi Network will have access to advertising and lead tracking tools which become available to them following their certification as registered affiliates. These tools will be accessible through a corporately controlled website or application based interface, and will include industry standard tools such as site analytics, Email/SMS broadcast and auto-response systems, lead tracking and scoring, editable data capture pages, etc.

The usage of these tools will be provided free of charge to the user, who will be responsible for attaching third party software to the platform to perform cost intensive functions such as email or text message broadcasting. In these cases, Quantinium requires the individual user to follow the terms and conditions of those 3rd-party platforms, and to comply with all laws related to solicitation in their county or providence. This CRM capability will appear along with a mechanism for the purchase, transfer, or trade of cryptocurrency, and will feature a live display of Quantinium's current market price, their own QuantumWALLET balances, a log of recent user actions, and a detailed receipt of pending affiliate related commissions and actions.

9.3 Quantum Wi-Fi Subscriber Application

The Quantum Wi-Fi Subscriber Application is a comprehensive tool designed to enhance the user experience by providing seamless access and robust management features for the Quantum Wi-Fi network. Subscribers can effortlessly connect to the Quantum Wi-Fi network, ensuring a secure and high-speed internet connection. The application also offers a user-friendly interface for managing customer accounts, including billing and support, making it easy for subscribers to monitor their usage, pay bills, and seek assistance when needed. Additionally, the integration with QuantumVPN allows users to secure their online activities, ensuring privacy and data protection while connected to any network.

Moreover, the Quantum Wi-Fi Subscriber Application introduces innovative features such as the Q-Spot Explorer, enabling users to locate available Wi-Fi hotspots with ease. This functionality ensures that subscribers can always find the best connectivity options in their vicinity. The application also incorporates a unique bounty system, allowing users to issue and collect bounties for identifying inactive, slow, or malfunctioning access points. This crowd-sourced approach not only helps maintain optimal network performance but also incentivizes proactive engagement from the user community, enhancing the overall reliability and efficiency of the Quantum Wi-Fi network.

9.3.1 *Q-Spot Explorer*

i. Quantum Subscribers and Providers have the ability to locate and utilize Wi-Fi Q-Spots globally via the locator function of the Q-Wallet.
ii. The Q-Wallet will provide Real-time Mapping, Speed Data, User Ratings, Network Availability, Open Bounties on Providers, etc.

9.3.2 *Q-Spot Validations and Bounties*

i. Map of open Bounties and Investigations.
ii. Statistics on user contributions toward validation process [Unsuccessful vs. Successful Bounties, Global Bounty Payments issued, and Individual Payments issued].

X. Subsequent Projects

10.1 Abstract

This paper presents a thoroughly developed blueprint for the implementation and design of the Quantum Wi-Fi Network. However, we consider the content of this paper to be just the beginning of the engineering, research and development of the Quantum Wi-Fi Network and fully expect a growing multiplicity of applications and business verticals as we continue our expansion. We believe that the tight integration of real-world hardware with a blockchain and native token is a novel

and valuable innovation that can be applied to other kinds of networks and wireless physical layers. We also believe that the future of blockchain is not about who has the most hashing power or access to the cheapest electricity, but about which blockchains effectively tie the mining proof to the provision of a valuable, verifiable service.

10.2 Future Development

Quantum Wi-Fi does not want to undercut the advances listed in this paper by underscoring its separate and significant developments in related fields. Indeed, many of our most competitive technological inventions and the innovative discoveries that made them possible have been purposefully omitted from this document to keep the nature of those advantages clandestine. That said, we wanted to include the mention of several public initiatives that the Quantum Wi-Fi Network has begun to implement, or intends to undertake shortly, by applying our currently completed IP, including:

i. Integration of proprietary Artificial Intelligence developments into blockchain-based technologies.
ii. Technology integration and advancement with multiple social media platforms.
iii. Implementation of NFT technology to protect intellectual property rights and user identities.
iv. Application of the Quantinium model to other wireless technologies.
v. Research and Development of additional Proofs to ensure security and scalability of QTI.
vi. Smart contract meta-platforms for broad commercial deployment.

XI. Ethos

11.1 Sustainability

There can be no doubt that public conservation efforts are a major driving force for change in the way society conducts industry. At the forefront of these movements, is a fundamental shift away from fuels that contribute to pollution and a concerted effort to increase the energy efficiency of mechanical and computational devices.

Within this context, one of the major pitfalls concerning the adoption of cryptocurrency comes to light; namely, that the high cost of performing multiple computations across millions of devices in order to service a small number of transactions is wasteful. This is exacerbated by the fact that most cryptocurrencies are introduced through the distribution of specialized computers called rigs, whose sole purpose is to solve difficult math puzzles in a lottery-like gamble to be the transaction's beneficiary.

Bitcoin, the most popular cryptocurrency in the world utilizes a system of verification called "proof of work" wherein hundreds of thousands of machines perform complex equations during the verification of a transaction, with just a small percentage of miners actually reaping the benefits of the mining process itself. That is, 99.99% of all computation and energy expenditure dissolves into thin air, accomplishing neither verification of the actual transaction, nor any additional appreciable real-world purpose.

To put this in perspective, the total carbon footprint of Bitcoin exceeds the total combined GHG emission reductions of all electric vehicles globally, approximately 51.9 Mt CO2 in 2020 [11]. Bitcoin alone is solely responsible for more pollution than the mechanical mining of the earth's physical gold, even exceeding the total energy consumption of all worldwide data centers [14]. In a global economy embracing the internet of things and desperately trying to reduce its carbon emissions, Bitcoin represents a strange inversion in technological efficiency. Compared with a centralized transaction such as those through Visa, each transaction requires approximately 600x as much processing time per transaction, and an energy inefficiency ratio of nearly 330,000 to 1 [15]. For all its various merits, one thing is certain; early attempts to decentralize currency have proved to be wildly and disproportionately unsustainable.

Quantinium solves this dilemma on multiple fronts. First and foremost, we utilize an existing and operational network of effective mining devices, without needing to produce new machinery or consume valuable computer components. This facet sidesteps common pitfalls related to the successful launch and adoption of the coin through computer rigs dedicated solely to the mining process. In practice, this means we are capable of expanding our network of devices without additional expenditures in energy, additional physical mining of precious metals, without production and waste of product packaging, and without the use of additional fuel for transportation and delivery of goods.

Secondly, our transaction verification process is fast and efficient, utilizing a proof concept which enables higher throughput, and avoids the unnecessary and wasteful energy utilization of *Proof of Work* models. Our blockchain utilizes approximately two million times less CO2 emissions per transaction than the average cryptocurrency, with a carbon-neutral footprint that encourages investment and growth among the environmentally conscious.

Because Quantinium is mined directly on wireless equipment that is already running to serve real-world applications, we do not put additional strain on energy infrastructure or increase the carbon footprint of those devices when we mine new QTI or expand our network of devices. Importantly, since these access points already run constantly to provide internet service to its current users, we are serving a secondary purpose when we consume the energy we need per transaction. That is, not only do we *avoid discarding energy* that is unused in the transaction process, we actively utilize *energy that would be discarded* without the use of our currency. In essence, the mining of our coin is the fiscal equivalent of recycling unused, or underutilized computational and energy expenditures. This is the kind of forward thinking and functional application of technology which constitutes a true and sustainable advancement in the cryptocurrency market, and represents our corporation's continued dedication to responsible stewardship of environmental resources.

11.2 Philanthropy

Early in the formation of the Quantum Wi-Fi Network, we decided it was important for our corporation to accomplish more than just a leap in technology which advantaged its users. We wanted to make sure our project benefited not only those who were technology magnates, investors, or internet users, but also those who were concerned with far more pressing matters in their personal lives.

We cannot imagine a more suitable expression of this desire, than for the Quantum Wi-Fi Network to utilize its collective financial strength and influence to help those most in need. It is this concept of people helping people that led us to partner with St. Jude's Children's Research Hospital to assist in their fight against childhood diseases.

11.2.1 *Purpose of St. Jude Children's Research Hospital*

St. Jude Children's ResearchHospital is a 501 [c][3] corporation founded in 1962 by Danny Thomas, with the stated mission of providing healthcare to children with advanced diseases, regardless of their ability to pay. The hospital primarily specializes in childhood cancers, and completely covers all additional expenses related to their treatment which are not covered by existing insurance. Approximately three-fourths of all expenses at St. Jude are offset through public donations, and to date, the innovations in treatment created through their research have increased childhood cancer survival rates from around 20% to just over 80%. For many diseases, St. Jude boasts the best childhood cancer survival rates in the world.[2] Moreover, these treatments and innovations are shared freely throughout the world without concern for patent or profit, to save the lives of as many children as possible. Parents of patients never receive a bill, and importantly, 82 cents of every dollar goes directly into the hospital system itself. We believe St. Jude Children's Hospital represents a powerful example of what collective humanitarianism can do for the world, and for this reason, we have chosen its organization, and its children, as the beneficiary of our Network's charitable donations.

11.2.2 *Function of Contribution*

Quantinium utilizes an inflation-control mechanism colloquially referred to as a coin's *burn rate*. In our system, [QTI] are exchanged for data credits [QDC], which are spent by Subscribers to obtain Quantum Wi-Fi access. These exchanged QTI are removed from circulation by sending them to a frozen public account with no key, thereby increasing the value of all remaining tokens. The Quantum Wi-Fi Network believes that this process should be more useful, and serve a secondary purpose.

With this goal in mind, we have tied the charitable donation rendered to St. Jude proportionally to Quantinium's burn rate, along with stipulations in place preventing its immediate liquidation upon receipt, as is the standard

[2] For detailed information about St. Jude Children's Hospital or to donate go to https://www.stjude.org/

practice. We believe this process will serve to maintain the stability of Quantinium's price and circulation, and give St. Jude a measure of control over its holdings, so as to empower them with more opportunities to provide essential access to healthcare for children.

XII. Team and Organization

12.1 Management Profile

Quantum Wi-Fi leadership is comprised of seasoned C-Level management professionals with a proven track record of successful technology projects and a rich, multifaceted experience profile in related and relevant professional venues:

12.1.1 Mr. Addiel Lopez [Founder & CEO]

Addiel Lopez is a seasoned entrepreneur and executive with an impressive track record spanning over two decades. His areas of expertise include entrepreneurship, management, business planning, financial analysis, telecommunications, operations, and decision analysis, establishing him as a versatile leader within the technology sector.

Before founding Quantinium Lopez made a name for himself in the telecommunications industry. As the founder and CEO of Skybridge Wireless, a leading provider of fixed wireless, fiber-optic, and global Internet networks and services, he demonstrated visionary leadership. Lopez successfully tackled conventional barriers such as high product and network deployment costs by introducing consumer-focused solutions with disruptive price-performance attributes. This unique business model, combined with innovative proprietary technologies, positioned Skybridge Wireless as an appealing alternative to traditional high-cost providers, fostering rapid market adoption of ubiquitous connectivity platforms.

Prior to his tenure at Skybridge Wireless, Lopez held several C-level positions within the telecommunications sector. His consistent year-after-year success in achieving revenue, profit, and business growth objectives showcased his adaptability and strategic acumen in diverse environments such as start-ups, turnarounds, and rapid-change situations.

Lopez's entrepreneurial journey began earlier as the founder and CEO of Sling Broadband, the largest Wireless Internet Service Provider (WISP) in North America. Under his guidance, Sling Broadband expanded its operations to 27 markets and accumulated an impressive customer base of 2.2 million users. With his strategic vision and business acumen, Lopez propelled the company to the forefront of the WISP industry, delivering reliable and high-speed wireless connectivity to countless satisfied customers.

As an experienced executive, Addiel Lopez is renowned for his strong business development capabilities and a proven track record of success in the telecommunications sector. He combines his extensive industry knowledge with a customer-centric approach to drive innovation and achieve exceptional results.

Lopez holds a Bachelor of Business Administration (B.B.A.) degree focused on Business/Managerial Economics from Michigan State University. His educational background, coupled with his extensive industry experience, has contributed to his well-rounded expertise and exceptional business leadership.

12.1.3 Mr. Marcus Thompson [Co-Founder & COO]

Marcus Thompson, an accomplished professional, holds a B.S. degree in International Business and Economics and is recognized as an accredited Chartered Financial Analyst. With an impressive fifteen-year track record in business development, operations, and financing of major facilities, he has successfully undertaken transactions across a comprehensive range of both traditional and non-traditional business segments. Thompson has established strong collaborative relationships with esteemed entities, including family offices, Fortune 500 corporations, private institutions, and high net worth individuals worldwide. Notably, he has earned multiple certificates from the renowned MIT Sloan School of Management, with a particular emphasis on Blockchain technologies.

Before his role as the founder of Quantinium, Thompson served as the co-founder and Chief Operating Officer of UNI Financial and Independent Power Group. This technology-based boutique oil & gas consulting platform, based in Saudi Arabia, achieved significant success before being sold and integrated into S.B.K. Financing, a prominent entity within SBK Holdings. Following this transaction, Thompson contributed his expertise as a strategic relationship advisor, aiding in the expansion of S.B.K's client base to include notable Chinese State-Owned Enterprises such as SINOPEC, CNPC, CEEC, and CREG.

Prior to his tenure at UNI, Thompson held the position of Portfolio Manager at Emperor Capital Group Properties, a renowned $4 billion real estate asset manager headquartered in Hong Kong. During his time there, he spearheaded the initial strategy to establish a joint venture within key emerging market cities, forming a $500 million commercial real estate fund. Furthermore, Thompson played a pivotal role in co-directing the establishment of a specialized international pension fund and investment banking team across the Asia and MENA regions. His responsibilities encompassed overseeing real estate portfolio acquisitions, including conceptualization, marketing, design development, and financing of major facilities.

Currently, Mr. Thompson resides on a ranch in Palm Beach alongside his wife and three children. The Thompson family is deeply engaged in a meaningful project called First-Push, a non-profit organization that is dedicated to providing skateboards and lessons to at-risk youth in the South Florida area. This passion project showcases their commitment to empowering and positively impacting the lives of young individuals in the community.

XIII. Recognition

First and foremost, our team would like to thank Almighty God, our families, and our friends for your love and support during the inception of this project. Without your continued encouragement, insight, and patience, through many long days and restless nights, none of this would have been possible. We would also like to thank our investors, directors, partners, and collaborators, all of whom have been invaluable assets on this great work.

Finally, and importantly, we would like to thank the many brilliant minds who came before us for their crucial work in the field of blockchain technology and cryptography. It is often said we stand on the shoulders of great men and women in history, and this has shown itself to be true time and time again in our own professional experiences. To all of those who have helped us get here, we hope to honor you through continued advancement in our field. This work in many respects, belongs to you as well.

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Note: This white paper is a continuous work in progress and does not represent the full scope of our completed or projected work. Many of our most innovative proprietary technologies have been purposefully omitted to maximize our competitive edge as we move to disrupt related industries. As we implement these technologies and take market share, we will update this whitepaper accordingly to reflect our advancements in those sectors. As all intelligent development is responsive and iterative in nature, adjustments to the resulting code or in the implementation of these technologies may temporarily differ from the protocols represented in this document.