Qwertycoin White Paper

QWERTYCOIN **[Ticker: QWC]** is a digital crypto-currency designed for everyday use. It supports simple CPU/GPU mining and masternode operations, Desktop / Mobile / Web wallets are provided for user's accessibility to QWERTYCOIN across multiple platforms.

FEATURES

- **Anonymous, Unlinkable and Untraceable Transactions** - Based on CryptoNote V2.0 Technology over a decentralized network.
- **Egalitarian Proof of Work (EPoW)** – Through Cryptonight-base algorithm with an implementation of ASIC resistant mining algorithm.
- **Egalitarian Proof of Service (EPoSe)** – Transaction fee distribution among master nodes based on Uptime as a measure of service.
- **Reserve Requirement System** - Development fees and donations collected over time will be stored in QWERTYCOIN Foundation.
- **No Pre-mining** - Community owned system and transparent developments and operations.
- **Free Master Nodes** - No mandatory minimum coin commitment to run Master Nodes.
- **Free Community Faucet** – Free QWC every 24 hours from community donations.
- **Transparent Operations and Management** – All accounts run by community funds can be monitored using tracking keys.

TECHNICAL SPECIFICATIONS

- Total Number of Coins: 184.47 Billion
- Current Target Block Time: 120 seconds ---> 20 seconds
- Time for Transaction Hashes: Instant (<4 seconds)
- Core Design: CryptoNote V2.0 – Forked from Bytecoin, Monero + Karbo + Digitalnote and Qwertycoin V1.0

ULTIMATE PROJECT GOALS

- Development of User-Friendly Wallet Software for Desktop/Mobile Computers, Web and Mobile Phones
- Q-Life app with chat + wallet + crypto exchange + store locator
- Robust Network (< 50 PPM Blockchain Reorg) with Blockchain/Network Monitoring Tool for all users
- Network Explorer feature that allows monitoring of blockchain
- User Population over 1 million
- E-Commerce/Woo-Commerce Integration + Local Stores as Fiat Exchange

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Introduction

Qwertycoin (Ticker: QWC) is a real community cryptocurrency, a decentralized digital asset, like Bitcoin. It is based on CryptoNote Technology V2.0. Nobody owns or controls Qwertycoin. It allows anonymous and trustless peer to peer transactions through a fair ASIC-resistant PoW mining algorithm and will implement EPoSe, a new algorithm concept exclusive to QWC.

Qwertycoin transactions are untraceable, unlinkable and your privacy is protected. Mathematics secures the QWC network and empowers individuals to control their own finance and information.

Official Links:

Github Source Code: https://github.com/qwertycoin-org

Bitcoin Talk Thread: https://bitcointalk.org/index.php?topic=2881418.0

Desktop Wallet & Daemon Download for Windows, Linux and MacOS: https://qwertycoin.org/wallet/#downloads

Mobile Wallet for iOS and Android: Please visit iOS App Store and Google Play Store

List of Pools: https://explorer.qwertycoin.org/#pools

Master Node Daemon Download: https://qwertycoin.org/wallet/#downloads / CLI versions of wallet software is Master Node software.

Master Node Map: https://nodes.qwertycoin.org

Official Faucet: https://faucet.qwertycoin.org

Community Voting System: https://voting.qwertycoin.org

Light Theme Logo: https://cdn.qwertycoin.org/images/other/qwclogo-512x512.png

Community Links:

Telegram: https://t.me/qwertycoin

Facebook: https://www.facebook.com/Qwertycoin-422694361519282/

Discord: https://discord.gg/U5amwCs

Twitter: https://twitter.com/Qwertycoin_QWC

Reddit: https://www.reddit.com/r/QWERTYCOIN/

Support & Contact Information:

Telegram: https://t.me/qwc_support

Email: support@qwertycoin.org

Vision

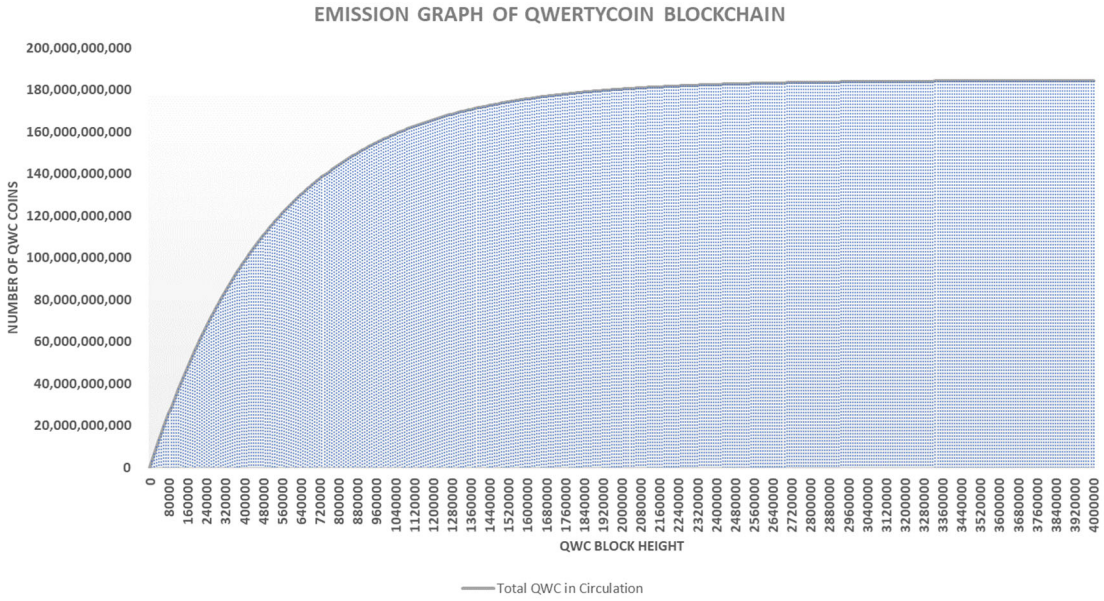
- **Reliable and easy to use/user-friendly blockchain service**
- **Decentralized development from crowd efforts and funding**
- **Privacy protection for the members of its network**
- **Abundant supply to allow a fair distribution among a large number of members**

Qwertycoin (QWC) team envisions the future of finance relies on distributed ledger technology, the blockchain. Unlike traceable bitcoin, QWC developers applied Cryptonote Technology V2.0, which has been verified to provide anonymity of users from the earlier generations of cryptocurrencies.

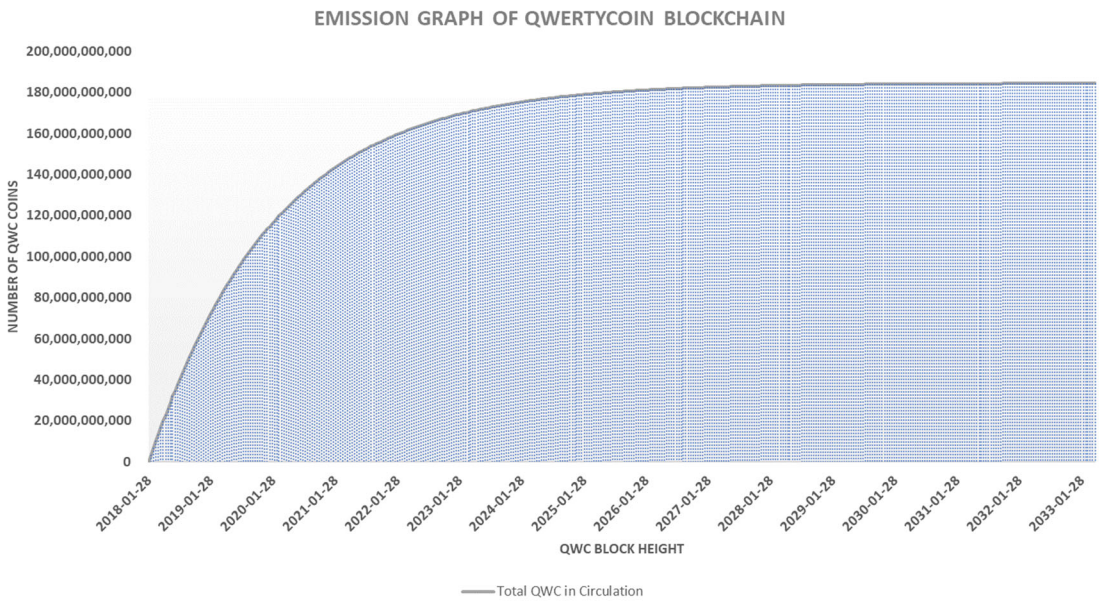
Everyone is free to join all QWC network and use its services at a low cost. However, QWC requires a central authority for the development and the management of QWC network and blockchain. Community engagements and donations are necessary to keep the development moving forward.

QWC team operates under the unanimous consensus of transparent management for all its members.

[Figure 1. Total QWC in Circulation per Bloch Height]



[Figure 2. Total QWC in Circulation per Date]



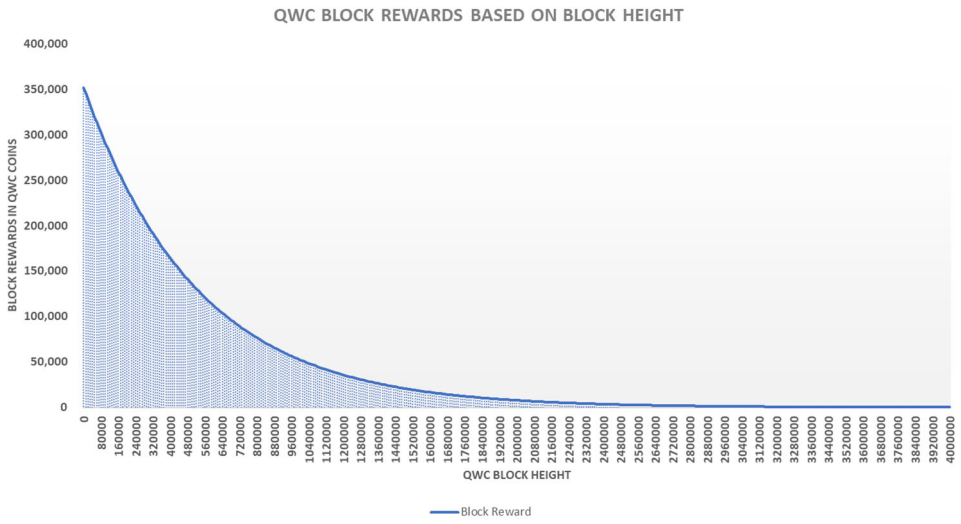
How to Get Coins [Mining]: Egalitarian Proof of Work (EPoW – Cryptonight Based Variant)

The word egalitarian stands for providing equal rights and equal opportunities. QWC network is an open source and is driven by community members. Anyone can join and support the network and get coins as compensation to their support through mining.

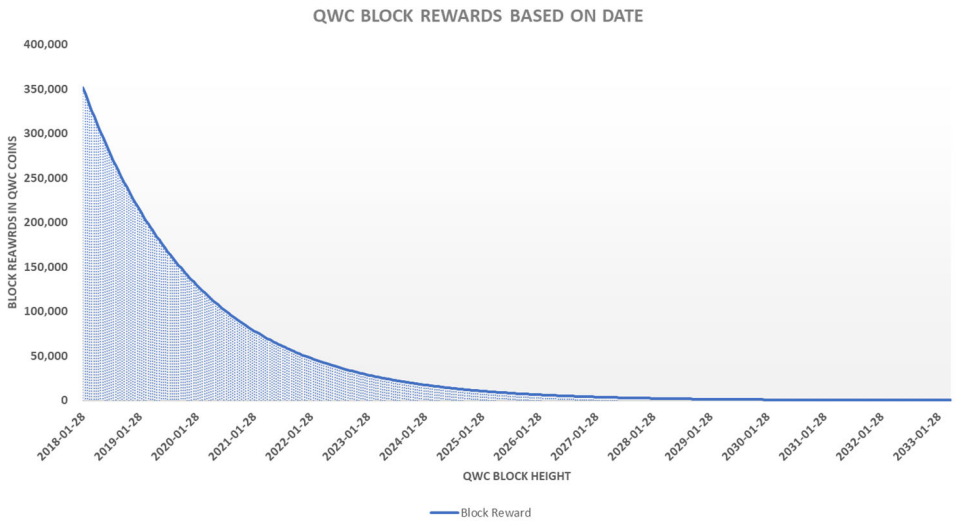
Cryptonote Technology V2.0 has a built-in block reward system called emission rate. It is a shape of log function and, because of its original design, QWC block rewards will reduce by each block found and eventually reach a point called 'tail emission'.

QWC has an emission factor of 19. Please refer to below graphs to see how block rewards are reduced over time.

[Figure 3. Block Reward Reduction per Block Height]



[Figure 4. Block Reward Reduction per Date]



- History of Mining Algorithm Changes

	Date	Block Height	From	To	Supporting Mining Equipment and Service
Initial		0	Cryptonight	-	CPU, GPU, FGPA, ASIC, Nicehash
1st Change		120,000	Cryptonight	Cryptonight- Heavy	CPU, GPU / The rest are penalized.
2nd Change	T.B.D.	T.B.D.	T.B.D.	T.B.D.	T.B.D.
3rd Change	T.B.D.	T.B.D.	T.B.D.	T.B.D.	T.B.D.

Qwertycoin community demanded anti-ASIC algorithm for the 1st change and the developers are committed to reflect the voices of the community to any changes in the future for possible algorithm changes through community voting system.

Please go to our explorer page (https://explorer.qwertycoin.org/#pools) and select a pool to mine from. Each pool provides information and a guide to setup for mining. Users can also mine with CPU using a built-in mining feature in QWC Desktop Wallet Software.

Make sure to create a wallet address before you start mining QWC. You can download QWC user manual for the assistance.

Transition from EPoW to EPoSe in QWC Network

As with any other blockchain technologies, QWC block height will increase over time, which also results in the blockchain data file growing continuously in a linear trend. With block time of 120 seconds and 1 MB block size, QWC blockchain size can increase close to **4 TB** at **99.95%** QWC circulation rate. Even after considering the storage capacity of consumer PC market is currently averaged at 500GB, the size of full blockchain data can be a problem for new users of QWC blockchain.

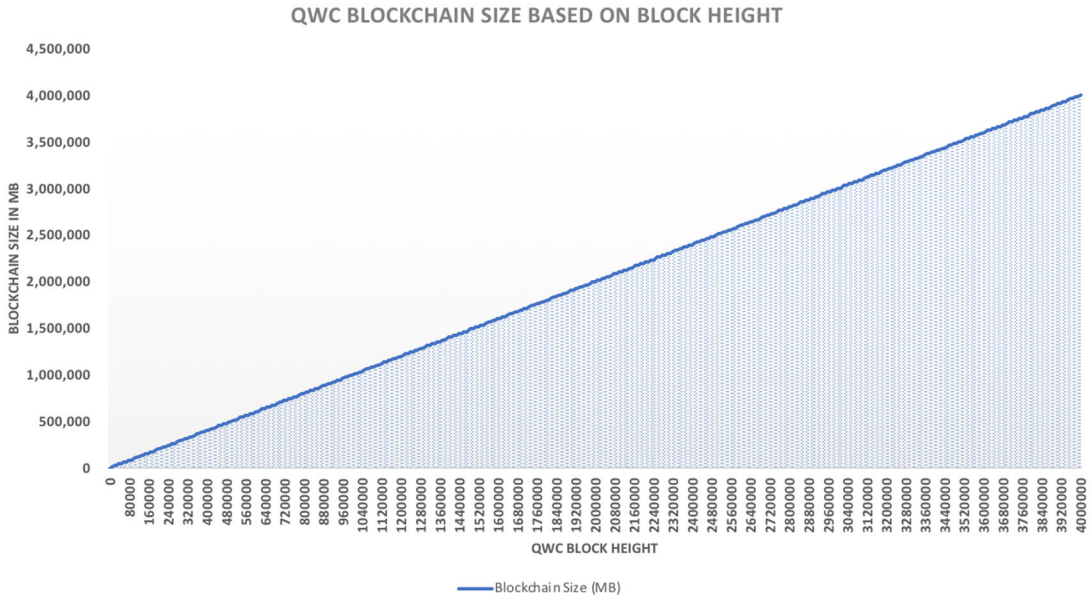
Eventually, the users of desktop wallet software are expected to connect their wallet software through remote nodes to reduce the percentage of their local hardware resource usage, while having an option to download the complete QWC blockchain data and sync in their local computers.

QWC team also realizes that

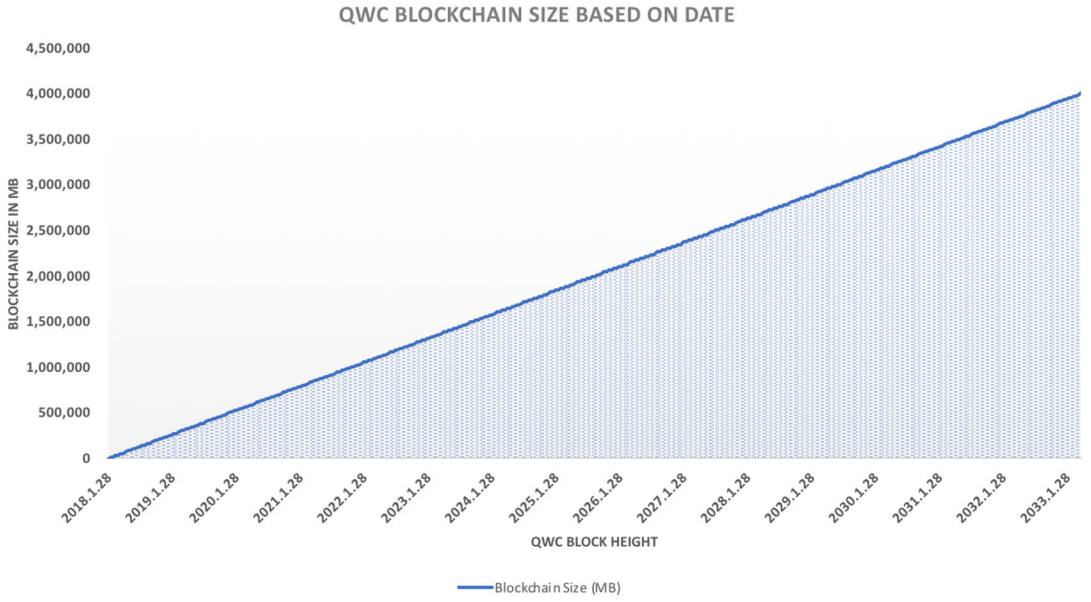
1. block rewards against energy consumption for EPoW mining process will become inefficient for the network and harmful to our environment in the later stage of QWC blockchain.
2. mobile wallet application will require remote nodes (without downloading blockchain file) for transactions.

Therefore, it is inevitable that QWC blockchain algorithm has to shift from individual miners(EPoW) to competent node operators(EPoSe) as more coins are mined towards QWC's maximum supply limit of 184.47 billion and the adaption rate of mobile wallet application increases over time.

[Figure 5. Blockchain Size per Block Height]



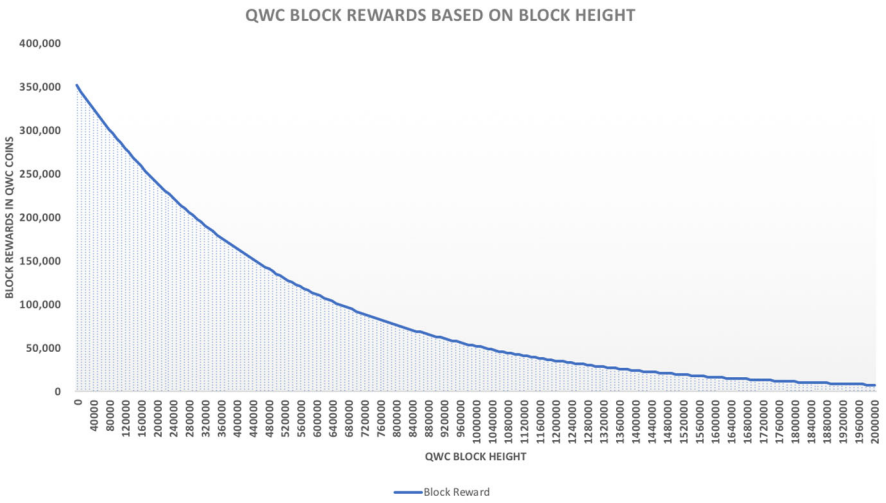
[Figure 6. Blockchain Size per Date]



One of the major challenges QWC members needs to consider for this algorithm transition is a heavy market correction arising from excluding existing mining population from the network, because EPoSe [Masteronde] algorithm allows only CPU mining.

The appropriate timing for this transition is to be decided by the community members. In this paper, a few proposals will be provided to assist our members to make informed decisions.

[Figure 7. Block Reward Reduction up to Block Height 2,000,000]



[Table 1. Transition Timing Proposal from EPoW to EPoSe]

Transition Timing Table	Proposal #1	Proposal #2	Proposal #3	Proposal #4	Proposal #5	Proposal #6
QWC Block Height:	200,000	250,000	300,000	350,000	400,000	450,000
Single Block Reward:	240,000 QWC	218,000 QWC	198,500 QWC	180,400 QWC	164,000 QWC	149,000 QWC
24 Hour Block Reward:	172,800,000 QWC	156,960,000 QWC	142,920,000 QWC	129,888,000 QWC	118,080,000 QWC	107,280,000 QWC
Expected Number of Mobil Users:	100 Users	150 Users	300 Users	350 Users	400 Users	450 Users
Expected Storage Capacity:	200 GB	250 GB	300 GB	350 GB	400 GB	450 GB
Expected Net Hash Rate:	2.0 MH	2.5 MH	3.0 MH	3.5 MH	4.0 MH	4.5 MH
Expected Daily Return of 1K Hash Rate:	86,400 QWC	62,784 QWC	47,640 QWC	37,110 QWC	29,520 QWC	23,840 QWC
GPU Mining Profitability*:	QWC > 0.00002 USD	QWC > 0.00003 USD	QWC > 0.00004 USD	QWC > 0.00005 USD	QWC > 0.00006 USD	QWC > 0.00008 USD
CPU Mining / Node Profitability**:	QWC > 0.000004 USD	QWC > 0.000006 USD	QWC > 0.000008 USD	QWC > 0.000010 USD	QWC > 0.000012 USD	QWC > 0.000016 USD
Expected Date of Height:	2018.11.3	2019.1.2	2019.3.22	2019.5.31	2019.8.8	2019.10.17

[Table 2. Transition Timing Proposal from EPoW to EPoSe]

Transition Timing Table	Proposal #7	Proposal #8	Proposal #9	Proposal #10	Proposal #11	Proposal #12
QWC Block Height:	500,000	700,000	900,000	1,000,000	1,500,000	2,000,000
Single Block Reward:	135,000 QWC	92,500 QWC	63,200 QWC	52,000 QWC	20,000 QWC	7,750 QWC
24 Hour Block Reward:	97,200,000 QWC	66,600,000 QWC	45,504,000 QWC	37,440,000 QWC	14,400,000 QWC	5,580,000 QWC
Expected Number of Mobil Users:	500 Users	700 Users	900 Users	1,000 Users	1,500 Users	2,000 Users
Expected Storage Capacity:	500 GB	700 GB	900 GB	1.0 TB	1.5 TB	2.0 TB
Expected Net Hash Rate:	5.0 MH	7.0 MH	9.0 MH	10.0 MH	15.0 MH	20.0 MH
Expected Daily Return of 1K Hash Rate:	19,440 QWC	9,514 QWC	5,056 QWC	3,774 QWC	960 QWC	279 QWC
GPU Mining Profitability*:	QWC > 0.0001 USD	QWC > 0.0002 USD	QWC > 0.0004 USD	QWC > 0.0006 USD	QWC > 0.0022 USD	QWC > 0.008 USD
CPU Mining / Node Profitability**:	QWC > 0.000025 USD	QWC > 0.00004 USD	QWC > 0.00008 USD	QWC > 0.00012 USD	QWC > 0.0004 USD	QWC > 0.0016 USD
Expected Date of Height:	2019.12.25	2020.9.28	2021.7.3	2021.11.18	2023.10.14	2025.9.7

* The assumption for GPU mining profitability is calculated based on AMD GPU with Cryptonight hash rate of 1,000.
** The assumption for the CPU mining / node profitability is calculated based on AMD CPU with Cryptonight hash rate of 1,000.
*** Mining profitability can be changed depending on net hash rate and both variables have a inversely proportional relationship.

How to Get Coins [Masternode]: Egalitarian Proof of Service (EPoSe – QWC Original)

Again, the word egalitarian stands for providing equal rights and equal opportunities. It is free to run a QWC masternode since node reward program does not offer a staking option for providing a node. In order for nodes to receive rewards, a node must be configured and used as a remote daemon in wallet software. Based on the number of transactions processed in remote daemon connections, Maximum 10 QWC is rewarded per transaction. [June 29th, 2018]

QWC nodes perform following tasks in the network.

1. Holding transactions in the memory pool so that a miner can find a block with a group of these transactions
2. Verifying one-time ring signature of entire blockchain
3. Validating correct blockchain during a chain split from PoW
4. Propagating validated blockchain to all daemons running in our network

As QWC develops and brings more traffic to our network, the performance of these nodes will be very critical to our success for following reasons.

1. When blockchain size increases, it will take more time to synchronize with the network since desktop wallets are mostly not online.
2. Mobile wallets will always use a remote daemon feature since the data itself is quite

QWC team believes that the existing PoS reward system is not fair since the cost of running a node can be more than its rewards for the amount of work they provide to the network, and node information is currently not available when wallet users want to choose a remote daemon. In order to change this, QWC will implement EPoSe system.

EPoSe is based on the concept of dedication in terms of conformance and performance of nodes to provide node functions to QWC network. It features is a reward program for node operators based on dedicated service time (Uptime).

There are 4 components to make EPoSe work.

1. Nodes, run by network participants
2. Sentinel, which checks the status of nodes periodically filters nodes based on conformance and performance criteria
3. Node Map, which shows geographical information of operating nodes
4. Network Explorer, which displays the network status of node and detailed information.

Sentinel provides API of online-node information after checking node's conformation to network requirements and the performance of its hardware and internet speed as well as 24-hour and Uptime measurements to Network Explorer(NE). NE displays information from Sentinel to allow users to select desired nodes while having the ability to check the overall status of each node. The API provided by Sentinel will be available for the selection of remote nodes.

There will be several conformance and performance criteria evaluation for nodes of which the data will be identified / measured / stored / analyzed to determine nodes eligible for the rewards of accumulated transaction fees over a set period. Through QWC's solution towards scalability,

EPoSe reward system has following features:

1. Rewards: accumulated transaction fees, which has been traditionally awarded to miners, are switched to node operators. Depending on the current operation costs of nodes, this reward scheme will be adjusted when deemed necessary.
2. Reward Period: 24 hours UTC time
3. EPoSe algorithm functions just like mining but provides infinite rewards throughout the lifetime of QWC blockchain without causing any inflation.

[Table 1. Transaction Fee & EPoSe Rewards Estimation]

Median Tx Size	Max. Blk. Size	Tx per block	Daily Tx Throughput	Transaction Fee	Multiplier	Transaction Fee (Approx.) per Blk.	Blk. per Day	Est. Tx Rewards Available for Uptime Nodes
<= 5 kb	1 mb	200 Tx	144,000 Tx	20 QWC/kb	1.0 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards
<= 25 kb	1 mb	40 Tx	28,800 Tx	500 QWC/Tx	5.0 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards
<= 100 kb	1 mb	10 Tx	7,200 Tx	2,000 QWC/Tx	20.0 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards
<= 200 kb	1 mb	5 Tx	3,600 Tx	4,000 QWC/Tx	40.0 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards
<= 300 kb	1 mb	3 Tx	2,160 Tx	6,670 QWC/Tx	66.7 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards
<= 400 kb	1 mb	2 Tx	1,440 Tx	8,000 QWC/Tx	80.0 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards
> 400 kb	1 mb	1 Tx	1,440 Tx	10,000 QWC/TX	100.0 X	20,000 QWC	720	14,400,000 QWC + Mining Block Rewards

Blockchain Development Roadmap

1. Stage 1: Currency Application Development (2017 – By the end of 2018)
   - Daemon Development and Optimization
   - CLI Wallet Development and Optimization
   - Desktop Wallet Development and Optimization
   - Mobile Wallet Development and Optimization
   - Commerce Integration Development
2. Stage 2: Currency Ecosystem Development (2018 – Continuous)
   - Invitation/Integration of Existing Commerce Applications
   - Commerce Integration Optimization
   - Local Fiat Exchange Commerce
   - Patches and Updates for All Software
3. Stage 3: Application Development (2019 – Continuous)
   - Search Engine + Desktop/Web/Mobile Wallet
   - Web Services + Web/Mobile Wallet
   - Mobile Apps + Web/Mobile Wallet
   - Activation of Local Fiat Currency Exchange (Stores)

Please check the current status of the roadmap from the official webpage.

Exchange Listing and Pricing Strategies

It is important to inform our members that your registrations on exchange platforms with personal information such as ID and bank/credit card accounts will/can expose your identity and your actions and outcomes from trading activities can be subjected to applicable laws and regulations.

In the early stage, QWC experienced issues with exchanges (Octaex(China), Crepcoin Exchange(Decentralized), Altex Exchange(Decentralized)) arising from various factors such as delays or lack of support, site shut-downs and service terminations, which caused damages to QWC members.

From past experience and failure to select proper exchanges for trading, the listing strategies for QWC are the followings:

- To have as many trading pairs as possible across multiple platforms
- To be listed on exchanges a verified business entity with a registration with transparency, reputation, volume and history
- To be listed on market tracker websites for broaden market exposure and bring awareness

Listed Exchanges

1. Crex24/Estonia - Funded by QWC Team [BTC]
2. BitexLIVE/Turkey - Funded by QWC Team [BTC (when QWC > 1 Satoshi) / DOGE / LTC]
3. BiteBTC/Singapore - Funded by QWC Team (ETH / BCH / DASH)

QWC community members should be aware that the listing contract can be nullified if there is not enough trading volume.

Next Target Exchanges

1. Stock.Exchange - Funded by QWC Team (LTC)

Due to excessive listing price of major exchanges, community donations are required to help raise the fund for listing QWC on following exchanges.

- Binance, HitBTC, Bittrex, Poloniex and other exchanges will be possible candidates.

Future Directions for the Team and the Community Members

A. Multi Language Support (Wallet Software and Web)

Qwertycoin wallet platforms(Desktop/Web/Mobile) and QWC official websites will support multiple languages. English is the default language for the software services. Additional language updates shall be requested through official communication channels.

B. Transforming QWC into Blockchain 3.0

QWC developers and communities shall find work towards to get below all five properties.

- High Scalability
- Interoperability
- Sustainability
- Privacy
- Governance

B-1. High Scalability

As written in the main part of this whitepaper, Blockchain size grows in linear trend under a fixed set of parameters. These configurations such as block time and block size embedded in codes will have be changed from QWC blockchain in the future depending on the outcome of QWC's high scalability solution.

QWC proposes to solve this scalability issue by generating a new (genesis) reference block after a fixed interval. Our approach is different from a hard fork, which most cryptocurrency developers opt to choose for solving this issue.

The validation of ring signature back to genesis block will add significant loads to QWC network in the later stage of any blockchain as the number of transactions increases. To minimize this bottle neck, a mega block will be issued. Since the ring signature verifications on this mega block will be confirmed by checking all previous signatures from the previous blocks, this block can act as a new reference point for future ring signature verifications thereafter.

A complete blockchain data file up to this mega block will be backed up and stored in the conventional blockchain data base as a backup source. Users can download this complete blockchain file as well if their systems have enough processing power and storage to run wallets or nodes. If not, they can always connect to remote nodes to use QWC blockchain.

It is a type of compression that will keep our working blockchain to a manageable size in the long run. Assuming that average internet speed of 100Mbps, which can provide 12.5MB/s download speed in optimal condition, this (genesis) reference block shall be created before every 100GB of blockchain size, equivalent to 100,000 blocks (approx. 139 day interval) to allow seamless network-wide synchronization within an hour.

In order to create this genesis reference block, all wallets initiate self-transactions to assure the number of coins per address is correctly reflected in this mega block to avoid ring signature verifications back to the genesis hash of individual address for future transactions.

The prerequisites required for this plan

1. 2FA enabled wallets (preferably mobile or web wallet)
2. A permission feature from users in wallet to **only allow self-transactions** required for generating reference blocks.
3. Optimizing difficulty algorithm (or network propagation time setting) depending on the total size of transaction hashes to be included in the reference block to avoid any fork from possible malicious attack.
4. Synchronization (Automatic download of the reference block) feature after reference block creation for daemon.

A higher transaction fee will be charged to wallets that failed to be included(or make a self-transaction) in the reference block for additional loads on QWC network as a penalty, but it also motivates users to adapt to mobile/web wallet environment, that boosts the effectiveness of QWC's scalability solution.

B-2. Interoperability and Privacy (Through Reserve Requirement System [The Purpose of Qwertycoin Foundation] and Billionaire Club)

The fundamental of blockchain interoperability largely depends on the basic algorithm on which cryptocurrencies are built. It will come down to choices of cryptocurrency systems or platforms that are popular and how many businesses/entities/organizations/communities are willing to build blockchains above such platform. QWC is a cryptocurrency and it means that it should be able to convert to other cryptocurrencies at users' discretions and used as a mean of payment.

Privacy is compromised when they make a C2C or C2F transactions through an exchange platform with AML and KYC processes in place.

To solve these two issues, QWC team proposes the following solution with three prerequisites.

1. QWC Foundation - Reserve Requirement System up to 7% of maximum QWC supply (Max. 18.447 Billion QWC)
2. QWC Billionaire Club - Total holding stake of 20% of maximum QWC supply (Max. 36.894 Billion QWC)
3. QWC exchange accounts on all exchange platforms that list/trade QWC.

First, a trading solution will be developed or implemented, not in a form of a conventional exchange, but more like a bot system for all members.

C2C Transaction (Coin to Coin Exchange)

Seller/Buyer -> Wallet (Transaction Fee) -> Individual Exchange (CEX/ DEX) & API-> C2C Exchange (Exchange Taker/Maker Fee)

to

Seller(Lender)/Buyer(Loaner) -> Qwerty Wallet -> C2C Exchange based on Best Market Price from Multi-Exchange API (CEX / DEX)

1. Buyer(Loaner) checks exchange rate from wallet software.

2. The bot will allocate the best trading deal on the market among exchanges.

3. Buyer(Loaner) initiates C2C exchange upon confirming exchange rate + service fee + receiving address of exchanged coin, which sends QWC to a designated wallet address + transaction fee in QWC (% of total transaction)

4. The QWC coins funded by Seller(Lender - Reserve Requirement System and/or QWC Billionaire Club) on exchange platform will initiate C2C exchange from the market and send the exchanged coin to Buyer(Loaner)'s designated address excluding a service fee form exchanged coin unit. (% of total transaction)

5. Exchange status will be confirmed in QWC wallet software.

Pro:
1. Personal identity is masked through this system.
2. Buyers can receive the best market deal by taking the lowest sell order rate from Multi-Exchange API (CEX / DEX) at their fingertips.
3. Lenders can receive the best market deal by making the highest buy order rate from Multi-Exchange API (CEX / DEX) at their fingertips + service fees.
4. By normalizing sell price in the market, buy price is also normalized and stabilized. This will be the main difference from other cryptocurrencies in terms of trading ecosystem.

Con: Investor holds risks against the overall stability of the QWC blockchain.

C2F / F2C Transaction (Coin to Fiat / Fiat to Coin Exchange)

For this type of trade It is important to inform our members that your registrations on exchange platforms with personal information such as ID and bank/credit card accounts will/can expose your identity and your actions and outcomes from trading activities can be subjected to applicable laws and regulations. We are dealing with centralized currencies and their systems in the end. This service is not an option for QWC network.

For cryptocurrency to fiat exchange, it would be the best to have local stores and businesses to engage and host an individual/independent exchange to allow more decentralized network of QWC blockchain. There will be no requirement of personal information for this type of transactions.

B-3. Sustainability

Through EPoSe in place, there will be an infinite circulation of incentives among network service providers and it will energy-wise more efficient for our environments. QWC blockchain and its infrastructure is supported by the core team and the source code is provided as an open source on github for 3rd party integration. The more 3rd parties services are provided, the less involvement of core team will take place in the service.

B-4. Governance

The most important part of the governance is the incentive system for participants. Please refer to EPoW and EPoSe sections of this white paper.

Unless Process Automation or AI takes over the entire development and implementation of new features or updates, QWC blockchain will have a centralized authority run by human that develops features, manages implementations/updates and provides support for the service.

QWC team (a centralized authority that consists of a group of people who volunteer to provide services) reflects the decisions of QWC community through a community voting system. All QWC members can participate in making community-wide decisions.