

# QuarkChain Root Chain PoSW Stake Mining Tutorial

## Glossary

- Staker and staker address: The participant deposits and stakes QKC to mine in the root chain. The staker address owns the staked QKC. The staked QKC will be locked at least 3 days until available for withdrawal.
- Signer: After the stake, the staker can designate a miner (and its address) to mine with its staked QKC. This can prevent malicious attackers from attacking the network by using the staked QKC.
- PoSW hash power benefit: Miners who meet the PoSW requirements can enjoy a benefit of 10,000 times hash power.
- Attack penalty: If someone is found to attack the network through PoSW mining in the root chain (such as a double-spend attack), the staked QKC may be confiscated.

## Deposit and Stake QKC

**Noted:** This tutorial is using [QuarkChain Devnet](#) as a demonstration.

**Step 1:** Enter the PoSW Smart Contract Interface <http://mainnet.quarkchain.io/posw>, where the contract is ONLY deployed in Chain 0, Shard 0. Log in to your account. As the initial state, the private account is in Locked state, the default setting for Signer is the account itself. (Please note: After deposit QKC, it takes 3 days to until the staked QKC is available to unlock and withdraw.)

## Account

Address  Chain 0 ▾ Shard 0 ▾

This Account is backed by MetaMask. [Learn More](#) 🐼

The current shard has the most QKC balance

## Tokens

▾

**599,987,175.297795603** (in shard)

599,997,175.297795603 (total)

[Show Detail](#)

## PoSW on Root Chain

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
LOCKED	0 QKC	0 / 512	0x6d3af223727309928cefdc8303a892dd0e4a3e95	N/A

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

Amount of QKC

[Generate Transaction](#)

**Step 2:** Click the “Add Stakes” button, and stake QKC with the amount as you want. Then the root chain staking will take effect.

### Account

Address  Chain 0 ▾ Shard 0 ▾

This Account is backed by MetaMask. [Learn More](#) 🦊

The current shard has the most QKC balance

### Tokens

QKC ▾

**599,987,175.297795603** (in shard)

599,997,175.297795603 (total)

[Show Detail](#)

### PoS on Root Chain

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
LOCKED	0 QKC	0 / 512	0x6d3af223727309928cefc8303a892dd0e4a3e95	N/A

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

Amount of QKC

[Generate Transaction](#)

Once the staking is successful, you can query the staking status. As shown in the figure, after staking 1 million QKC, you can enjoy the PoSW hash power benefit of one root chain block in every 512 blocks.

### Account

Address  Chain 0 ▾ Shard 0 ▾

This Account is backed by MetaMask. [Learn More](#) 🐼

The current shard has the most QKC balance

### Tokens

QKC ▾

**598,987,175.297753958** (in shard)

598,997,175.297753958 (total)

[Show Detail](#)

### PoSW on Root Chain

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
LOCKED	1,000,000 QKC	1 / 512	0x6d3af223727309928cefcd8303a892dd0e4a3e95	N/A

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

Amount of QKC

[Generate Transaction](#)

**Step 3:** Changing the signer address. Click the “Change Signer ” button, and input your new signer address. Submit the transaction to modify your signature address.

### Account

Address  Chain 0 ▾ Shard 0 ▾

This Account is backed by MetaMask. [Learn More](#) 🦊

The current shard has the most QKC balance

### Tokens

QKC ▾

**598,987,175.297753958** (in shard)

598,997,175.297753958 (total)

[Show Detail](#)

### PoSW on Root Chain

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
LOCKED	1,000,000 QKC	1 / 512	0x6d3af223727309928cefcd8303a892dd0e4a3e95	N/A

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

New Signer

[Generate Transaction](#)

After the modification, you can check the modified signature address:

The screenshot displays a web interface with two main sections: 'Account' and 'Tokens'. The 'Account' section shows an address: 0x6d3af223727309928CeFCD8303A892DD0E4A3E950000cDdD, with dropdowns for 'Chain 0' and 'Shard 0'. Below the address, it states 'This Account is backed by MetaMask. Learn More' and 'The current shard has the most QKC balance'. The 'Tokens' section shows 'QKC' with a balance of '598,987,175.297725414 (in shard)' and a total of '598,997,175.297725414 (total)'. A 'Show Detail' button is present.

The 'PoSW on Root Chain' section shows the current staking status for mining the root chain. It includes a table with the following data:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
LOCKED	1,000,000 QKC	1 / 512	0xfee3d08216f0bfe96a5c0f5df9ec9b2577ad64f0	N/A

Below the table, there is a note: 'Please refer to this document on how PoSW works for root chain. For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.' At the bottom, there are buttons for 'Add Stakes', 'Change Signer', 'Lock / Unlock', and 'Withdraw'. A form for 'Amount of QKC' is also visible, with a placeholder 'e.g. 1000000' and a 'Generate Transaction' button.

**Step 4** (Very Important): For the cluster, you need to modify the `ROOT_SIGNER_PRIVATE_KEY` in the JSON configuration file (`mainnet/singularity/cluster_config_template.json`). Fill in the private key corresponding to the signature address that you modified on Step 3. (In the future, scripts can be modified directly, or the signature server can be used to sign the dug-out root blocks.)

# Withdraw Staked QKC

**Step 1:** Unlock the staking account. Click the “Lock/Unlock” button, then click “Generate transaction” to unlock your staking account.

### Account

Address:  Chain 0 ▾ Shard 0 ▾

This Account is backed by MetaMask. [Learn More](#) 🐼

The current shard has the most QKC balance

### Tokens

QKC ▾

598,987,175.297725414 (in shard)

598,997,175.297725414 (total)

[Show Detail](#)

### PoSW on Root Chain

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
LOCKED	1,000,000 QKC	1 / 512	0xfe3d08216f0bfe96a5c0f5df9ec9b2577ad64f0	N/A

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

[Generate Transaction](#)

After unlocking, you will find the account is under unlocked status.

### Account

Address  Chain 0 ▾ Shard 0 ▾

This Account is backed by MetaMask. [Learn More](#) 🦊

The current shard has the most QKC balance

### Tokens

QKC ▾

**598,987,175.297678206** (in shard)

598,997,175.297678206 (total)

[Show Detail](#)

### PoS on Root Chain

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
UNLOCKED	1,000,000 QKC	0 / 512	0xfe3d08216f0bfe96a5c0f5df9ec9b2577ad64f0	12/8/19, 3:09 PM

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

Amount of QKC

**Can't add stakes when unlocked.**

[Generate Transaction](#)

**Step 2:** After unlocking, you have to wait three days to be able to withdraw the staked QKC. You can check the status of the contract to see the staking time. After the withdrawable time, you can submit the transaction to withdraw the staked QKC.

**Account**

Address: 0x6d3af223727309928CeFCD8303A892DD0E4A3E95000cDdD Chain 0 Shard 0

This Account is backed by MetaMask. [Learn More](#)

The current shard has the most QKC balance

**Tokens**

QKC

598,987,175.297678206 (in shard)

598,997,175.297678206 (total)

Show Detail

**PoSW on Root Chain**

Your current staking status for mining root chain:

Lock Status	Stakes	Allocation	Signer	Withdrawable Time
UNLOCKED	1,000,000 QKC	0 / 512	0xfe3d08216f0bfe96a5c0f5df9ec9b2577ad64f0	12/8/19, 3:09 PM

Please refer to [this document](#) on how PoSW works for root chain.

For following actions, gas prices default to 1 Gwei and gas limits are set automatically as sane defaults.

[Add Stakes](#) [Change Signer](#) [Lock / Unlock](#) [Withdraw](#)

**Can't withdraw before allowed time.**

[Generate Transaction](#)

GPU Mining Software:

Please download the GPU mining software at :

<https://github.com/QuarkChain/ethminer/releases>. If you want to PoSW mining in the root chain, please set the shard ID to 9999.