



Whitepaper
version 1.0.0.3



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Abstract

As the blockchain industry approaches its post-inception phase, lots of key technology foundations are now mature enough to build robust consumer-facing products that are available to a wider audience. Blockchain is propelling change in many areas of traditional business, forcing incumbents to adapt their more traditional business models. All sectors (such as banking, insurance, logistics and governance) are affected as new products are redefining the way we think of money, transactions, value and trust.

Despite the industrial disruption and technological advancement brought about by blockchain, the swift digital payments between buyers and sellers of physical services is still untapped. Digital payment systems have been experiencing quite a number of hindrances in traditional institutions, banks and credit banks. Despite the benefits of very low fees, speed and low barrier of entry associated with crypto payments, clear and developed advancement in transactional security has not been implemented to the market. Users seek a robust consumer protection system that protects their purchases and other forms of transactions. Wouldn't it be amazing if we could solve this dilemma? This is what the SagaCoin platform plans to solve.

Our aim is to offer seamless utility on public market. SagaCoin is designed to be easily integrated into several applications, including payment platforms, exchanges and marketplaces. We focus is to build a next-generation payment gateway that gives developers, investors and members of the general public that are not tech-savvy to leverage the power of cryptocurrency in buying goods and services with confidence from merchants. We aim to drive the adoption of the platform by the public thereby providing a means to shield them from the risk of accepting cryptocurrency.

About SagaCoin

SagaCoin was inspired from the word Saga which means “a long story of heroic achievement, especially a medieval prose narrative in Old Norse or Old Icelandic.” That’s the reason we use the old Viking style as SagaCoin's theme.

SagaCoin leverages the best minds in blockchain technology with a mature ecosystem and progression propelled by a dedicated foundation team. We aim to build a global payment platform that gives the assurance that cryptocurrency is not only meant for tech-savvy people. Our goal is to ensure that SagaCoin becomes widely used in every city in the world.

SagaCoin was launched as an open source cryptocurrency on 3rd December, 2017. It is a decentralized and secure masternode network project with long term goals. Our focus is to create a cryptocurrency that can be accessed by everyone as a global payment platform for developers, investors and the general public as a whole. SagaCoin is maintained by a friendly and committed community. We have many projects on ground that will help us to innovate and build on our reputation to launch into the mainstream as the most trusted and exciting cryptocurrency project in the market.



SagaCoin will be a revolutionary global payment platform that will enable developers, investors and the general public to use cryptocurrency to pay merchants. We provide users with the safety and convenience associated with consumer-protection. We combine the best payment protection features of current generation fiat systems with the innovative features of blockchain while combining the unique features provided by our platform.

Our platform will provide the user protection that buyers take for granted in traditional online transactions. We want to build upon the features of cryptocurrencies to give room for fast transactions, lower fees and low cross-border transaction friction, thereby enabling merchants to sell to a growing worldwide audience of crypto-holders. All these features will be integrated to create an incredible product. We are also taking a step beyond creating an innovative product by giving everyone in the world the opportunity to become a supporter.

Our platform will bring tangible value to our supporters and also drive the growth of global payment transactions. We believe cryptocurrencies are evolving and become much more than speculation and are here to stay in the minds and wallets of consumers. SagaCoin will be a game-changer that will change how merchants and buyers utilize cryptocurrencies.

Specification

Ticker :	SAGA
Algorithm :	Scrypt
Block Time :	120 seconds
Max Coin Supply :	42,000,000
Block Reward :	25 SAGA 1st year (1-50 blocks 0 SAGA reward) 12.5 SAGA 2nd year 6.25 SAGA thereafter
Block Size :	2 MB
Proof of Stake :	180% masternode, 20% coin stake [total 200%] (1st year) 90% masternode, 10% coin stake [total 100%] (2nd year) 45% masternode, 5% coin stake [total 50%] (thereafter)
Minimum Stake Age :	8 hours
Transaction Confirmation :	10 blocks
Difficulty Retarget :	10 minutes
Masternode requirement :	2,500 SAGA
Masternode reward :	90% stake reward

Why SagaCoin



Low Transaction Fee

SagaCoin's low transaction fee is one of the reasons why it should be adopted.

SagaCoin's minimum transaction fee is 0.000001 SAGA per 1000 bytes of transaction data. It is less than 250 bytes per coin transaction, so usually only 0.000001 SAGA is required for the transaction fee.

Fast Block Time

SagaCoin has a block time of 120 seconds. That's 5X faster than Bitcoin. This makes the confirmation of transactions faster, thereby giving room for more capacity in transactions.

Big Block Size

SagaCoin has a maximum 2MB block size, That's 2X Bitcoin's block size. This block size enables SagaCoin to have twice as many transactions compared to Bitcoin in a single block.

With faster block time and bigger block size, SagaCoin has 10X more transactions compared to Bitcoin. This makes it possible to avoid high transaction fee.



MasterNodes

The masternode feature of SagaCoin helps it to handle the spreading of transactional data. Masternode is an essential element of cryptocurrency as they handle the spreading of transactional data. It is what makes a coin decentralized. This helps SagaCoin to use one server to distribute new data.

A masternode is a specific type of decentralized server that is used to perform certain tasks on a coin's blockchain, such as adding privacy function.

It is a cryptocurrency full node or computer wallet that keeps the full copy of the blockchain in real-time, just like Bitcoin full nodes and is always up and running. Masternodes are not standalone but they are always communicating with other such nodes to make a decentralized network.

The masternode feature also makes SagaCoin resistant to Sybil attacks which is where imposters disguise themselves as several servers so that they can manipulate the blockchain as they want.



Private

SagaCoin performs every single transaction by using Darksend. This keeps payments private and cannot be tracked by anyone. Privacy guarantees are designed to benefit legitimate users who do not want to disclose their financial details to the public.



Security

SagaCoin utilizes advanced Scrypt hashing to protect blockchain network. Scrypt algorithm was specifically designed to make it costly to perform large-scale custom hardware attacks by requiring large amounts of memory.



Global

SagaCoin features payment to be sent or received worldwide easily. Its low transaction fees and block time make it much cheaper and faster compared to ordinary remittance or money transfer service. SagaCoin transaction can be executed in approximately 2 minutes or 120 seconds.



Proof of Stake

Proof-Of-Stake is a type of algorithm by which a cryptocurrency blockchain network aims to achieve distributed consensus. In Proof-Of-Stake, a person can mine or validate block transactions according to how many coins he or she holds. Thus, anyone can become a miner. This makes it more decentralized in comparison to Proof of Work. Staking not only provides extra coins to holder but also secure the network to move forward even if there is no single miner for PoW.



Roadmap

4th Quarter 2017

LAUNCH

- Launch SagaCoin **3 Dec17** ✓
- Block Explorer 1 **3 Dec17** ✓
- Block Explorer 2 **5 Dec17** ✓
- Block Explorer 3 **11 Feb18** ✓
- Exchanges Coinsmarket **4 Dec17** ✓
- Exchanges Cryptopia **28 Dec17** ✓
- Exchanges Escodex **19 May18** ✓
- Exchanges Qiex **13 Jun18** ✓

2nd Quarter 2018

WALLET

- Whitepaper **28 May18** ✓
- Mobile Wallet (Android)
- Web Wallet
- Paper Wallet **17 May18** ✓

4th Quarter 2018

INTEGRATION

- [Create various plugins for ecommerce platform]
- Self-hosted payment gateway
- List at ecommerce payment gateway

1st Quarter 2018

MARKETING

- Signature Contest **23 Jan18** ✓
- Signature Campaign **postponed**
- Translation Campaign **21 Jan18** ✓
- Articles & Videos **done & on going**

3rd Quarter 2018

IMPROVEMENT

- [Various Stability Security Enhancement]
- Wallet Upgrade **29 Mar18** ✓
- Node Upgrade **17 Apr18** ✓

FUTURE DEVELOPMENT

- Atomic Swap
(Will be announced with more projects and development in future)

Milestone

2017

- 03 December
 - Launched SagaCoin & genesis block mined
 - Setup Block Explorer 1
- 04 December
 - Fixed Windows wallet version 1.0.0.3
 - Listed at CoinsMarkets.com
- 05 December
 - Setup Block Explorer 2
- 06 December
 - Released Masternode Guide
- 08 December
 - Listed at Masternodes.online
- 10 December
 - Listed at CoinMarketCap.com
- 10 December
 - Listed at CoinCodex.com
- 15 December
 - Setup Discord social channel
- 25 December
 - Listed at Masternodo.com
 - Listed at Masternodes.pro
- 28 December
 - Listed at Cryptopia.co.nz

2018

- 21 January
 - Translation Campaign
- 23 January
 - Signature Contest
- 11 February
 - Setup Block Explorer 3
 - Upgraded Block Explorer 1
- 12 February
 - Listed at Mnode.club
- 29 March
 - Released new wallet version 1.2.0.0
- 16 April
 - Added FAQ page
- 17 April
 - Upgraded node system
- 16 May
 - Added Bootstrap
- 17 May
 - Released Paper Wallet
- 19 May
 - Listed at Escodex.com
- 28 May
 - Released Whitepaper
- 13 Jun
 - Listed at Qiex.com

On Going

- Articles & Videos

TBA

- Signature Campaign

TBA

- Mobile Wallet (Android)

TBA

- Web Wallet

TBA

- E-commerce Plugins

TBA

- Payment Gateway

TBA

- Atomic Swap



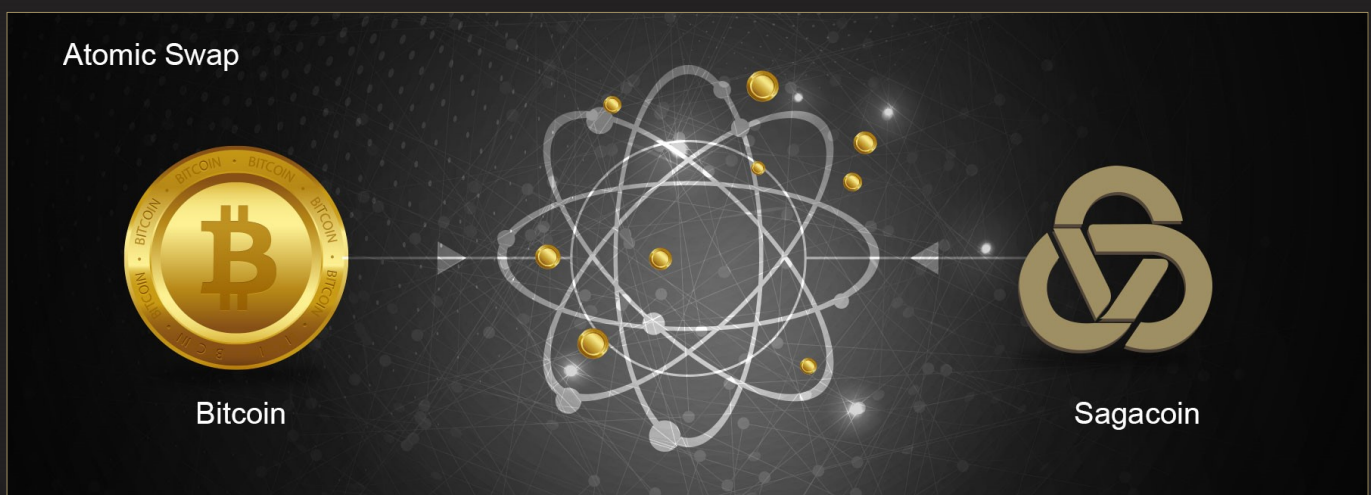
The Future

Atomic Swap / Cross Chain Swap

Atomic Swap is a very new concept and feature in cryptocurrencies, the main purpose of Atomic Swap is to allow for the exchange of one cryptocurrency for another cryptocurrency without the need for a trusted third party. In traditional cryptocurrencies a trusted third party such as an cryptocurrency exchange, is necessary to perform a swap of cryptocurrencies in order to prevent one party from sending a currency without receiving a currency in return.

An Atomic Swap system uses a hash time-locked smart contract so that a party must deliver the currency to be swapped within a specified time, or else the transaction will be cancelled. This preserves atomicity in that either the swap will take place, or no currency will be swapped.

As at now, there is no timeline for implementation of Atomic Swap for SagaCoin since it is still a very new concept. However, we are working on researching and finding the best implementation methods. We are very excited to have this great feature in future. Once it is implemented, you will be able to swap SAGA to BTC or vice versa.



Payment Gateway

SagaCoin aims to be one of the popular cryptocurrencies that widely use as payment transactions. In order to reach this goal, we have to implement payment gateway so that consumer can pay goods or services by using SAGA. Our plan is to implement a self-hosted payment gateway for SAGA to be used by early adoption of SAGA in payment, and later will apply to be listed in those popular cryptocurrency payment gateways that available as a plugins for e-commerce platforms such as Wordpress, Zen Cart, Magento, and others.

To make it simple, we will design it in such a way that it can be used by people that are not tech-savvy, and easy integration into online store.



Masternode Reward

SagaCoin has a very special masternode reward, the reward is calculated based on PoS (Proof-Of-Stake) instead of PoW (Proof-Of-Work). Each PoS block generates different amount of SagaCoin based on the coins staked.

There is only one masternode winner for each PoS block, the winner is designated by hash calculation similar to PoW. Therefore, a masternode could earn rewards in three continuous PoS blocks, and a masternode could also earn nothing in thousand PoS blocks.

SagaCoin has 200% PoS block reward in the first year, 180% is allocated to masternode and 20% for coin staker. The PoS calculation based on formula:-

```
nSubsidy = nCoinAge * COIN_YEAR_REWARD * 33 / (365 * 33 + 8);
```

For example:

Total coins staked at block 100,000 is 324 SAGA, therefore 291.60 SAGA rewarded to masternode winner and coin staker get 32.40 SAGA.

Halving

The reason behind halving is to avoid the scarcity of the cryptocurrencies as the miners and investors are of abundant rate and are growing up like a skyscraper. But as the height increases, there is a high chance of complete demolition with a little quake. It was introduced into cryptocurrency mining to improve the stability of the system and to give out plentiful of opportunity for everyone.

SagaCoin's rewards halving (PoW and PoS) first time at the second year, and second time at the third year. Coding as following:

```
static const int YEAR1_BLOCKS = 262800;  
static const int YEAR2_BLOCKS = 525600;
```

(Total seconds per day = 86,400 seconds / SagaCoin's block time = 120 seconds) X Total days per year = 365 days = 262,800 blocks per year.

There are estimated total 720 PoW blocks per day or 21,600 blocks per month or 262,800 PoW blocks per year. And estimated 240 PoS blocks per day or 7,200 blocks per month.

Here is the table of total estimated blocks generated monthly and halving time:-

Month	Est. PoW Blocks	Est. PoS Blocks	Total Blocks Accumulated
Dec 2017	21,600	7,200	28,800
Jan 2018	21,600	7,200	57,600
Feb 2018	21,600	7,200	86,400
Mar 2018	21,600	7,200	115,200
Apr 2018	21,600	7,200	144,000
May 2018	21,600	7,200	172,800
Jun 2018	21,600	7,200	201,600
Jul 2018	21,600	7,200	230,400
Aug 2018	21,600	7,200	259,200
Sep 2018	21,600	7,200	288,000 <i>(1st Halving)</i>
Oct 2018	21,600	7,200	316,800
Nov 2018	21,600	7,200	345,600
Dec 2018	21,600	7,200	374,400
Jan 2019	21,600	7,200	403,200
Feb 2019	21,600	7,200	432,000
Mar 2019	21,600	7,200	460,800
Apr 2019	21,600	7,200	489,600
May 2019	21,600	7,200	518,400
Jun 2019	21,600	7,200	547,200 <i>(2nd Halving)</i>

Since SagaCoin calculates reward halving by PoW blocks only, the actual halving date should be earlier than ONE YEAR which is stated in our specification. According to our table above, the estimated first halving should happen in September 2018 instead of December 2018, and the estimated second halving will be in Jun 2019.

Full PoW block reward is 25 SAGA, so first halving is 12.5 SAGA and second halving is 6.25 SAGA. PoS block reward also reduces from 200% (180% masternode + 20% coin stake) to 100% (90% masternode + 10% coin stake) at first halving, and 50% (45% masternode + 10% coin stake) at second halving.

Important notes:

Actual total PoW 9,644 blocks + PoS 17,634 blocks = 27,278 blocks from 1st Apr 00:00:00 to 30th Apr 23:59:59 (from block 130,088 to block 157,365), which is less than estimated 21,600 (PoW) + 7,200 (PoS) = 28,800 blocks. This is because of PoW difficulty and coins maturity in PoS.

Coin Generation Over Time

SagaCoin is a PoW and PoS coin. Initial PoW block reward is 25 SAGA, and 200% of PoS reward. More details can be found under the Halving section.

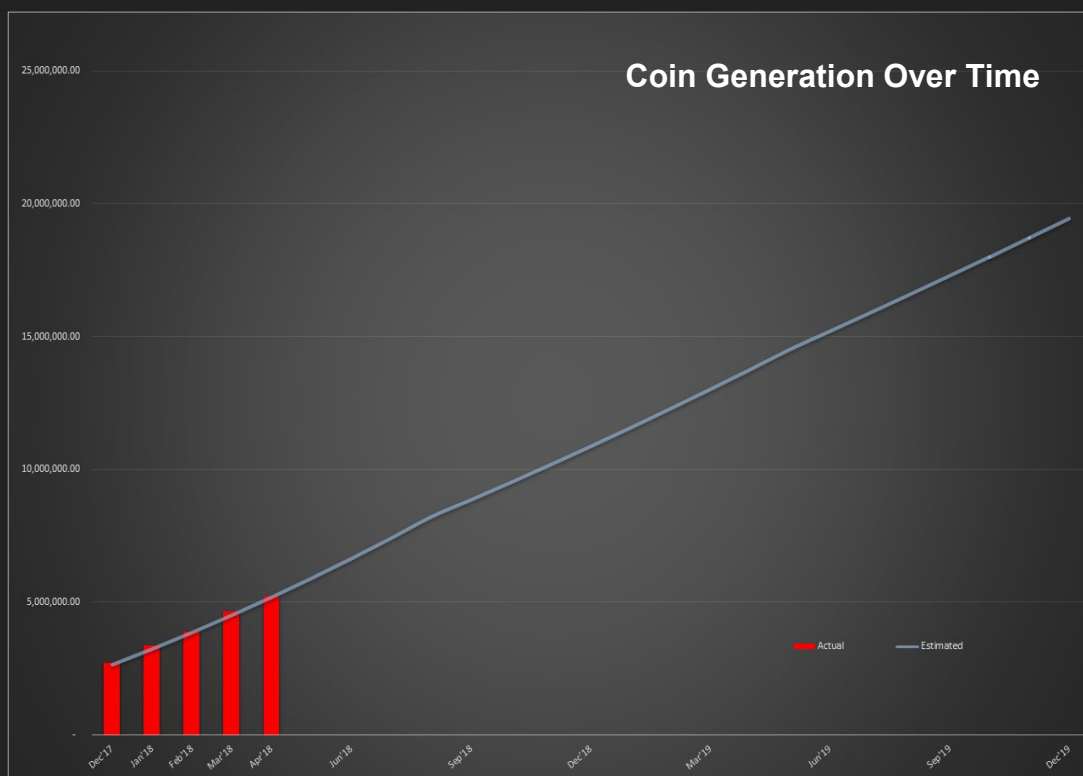
SagaCoin has estimated total PoW 21,600 blocks per month. Hence estimated total $21,600 \times 25 = 540,000$ SAGA per month with PoW difficulty = 1, but we have actual average of 350,000 SAGA monthly only over the past 5 months due to high PoW difficulty, so we will use 350,000 SAGA as the estimated PoW mined coins per month.

Thus, estimated PoW halving amount is calculated based on 350,000 SAGA (first halving = $350,000 / 2 = 175,000$, second halving = $175,000 / 2 = 87,500$).

It is very difficult to estimate PoS coins generated because of PoS difficulty and total SAGA locked in masternodes (coins locked in masternodes do not stake). According to our actual past 5 months statistics, we have 216,931.1743 SAGA in the first month and average incremental of 30,000 SAGA per month. Estimated PoS halving amount is calculated based on incremental 30,000 SAGA (first halving = $30,000 / 2 = 15,000$, second halving = $15,000 / 2 = 7,500$)

SagaCoin has total 5% premined from maximum coin supply, which is 2,100,000 SAGA reserved for developer fund, coin development such as marketing, exchange listing fee and etc. And most importantly to ensure staking well for masternode reward in the early stage.

So, highlighted in the table below is the estimated and actual coins generated over time by month:



Month	Actual PoW	Actual PoS	Actual Total Accumulated
Dec 2017	2,507,475	216,931	2,724,407
Jan 2018	404,556	230,162	3,359,125
Feb 2018	288,600	242,098	3,889,824
Mar 2018	390,676	351,977	4,632,478
Apr 2018	241,101	349,630	5,223,209

Here is the table for estimated coins generated over time by month:

Month	Estimated PoW	Estimated PoS	Estimated Total Accumulated
Dec 2017	350,000	210,000	2,660,000 (2,100,000 + 350,000 + 210,000)*
Jan 2018	350,000	240,000	3,250,000 (2,660,000 + 350,000 + 240,000)
Feb 2018	350,000	270,000	3,870,000 (3,250,000 + 350,000 + 270,000)
Mar 2018	350,000	300,000	4,520,000 (3,870,000 + 350,000 + 300,000)
Apr 2018	350,000	330,000	5,200,000 (4,520,000 + 350,000 + 330,000)
May 2018	350,000	360,000	5,910,000 (5,200,000 + 350,000 + 360,000)
Jun 2018	350,000	390,000	6,650,000 (5,910,000 + 350,000 + 390,000)
Jul 2018	350,000	420,000	7,420,000 (6,650,000 + 350,000 + 420,000)
Aug 2018	350,000	450,000	8,220,000 (7,420,000 + 350,000 + 450,000)
Sep 2018 <i>(1st Halving)</i>	175,000	465,000	8,860,000 (8,220,000 + 175,000 + 465,000)
Oct 2018	175,000	480,000	9,515,000 (8,860,000 + 175,000 + 480,000)
Nov 2018	175,000	495,000	10,185,000 (9,515,000 + 175,000 + 495,000)

continue next page

Month	Estimated PoW	Estimated PoS	Estimated Total Accumulated
Dec 2018	175,000	510,000	10,870,000 <i>(10,185,000 + 175,000 + 510,000)</i>
Jan 2019	175,000	525,000	11,570,000 <i>(10,870,000 + 175,000 + 525,000)</i>
Feb 2019	175,000	540,000	12,285,000 <i>(11,570,000 + 175,000 + 540,000)</i>
Mar 2019	175,000	555,000	13,015,000 <i>(12,285,000 + 175,000 + 555,000)</i>
Apr 2019	175,000	570,000	13,760,000 <i>(13,015,000 + 175,000 + 570,000)</i>
May 2019	175,000	585,000	14,520,000 <i>(13,760,000 + 175,000 + 585,000)</i>
Jun 2019 <i>(2nd Halving)</i>	87,500	592,500	15,200,000 <i>(14,520,000 + 87,500 + 592,500)</i>
Jul 2019	87,500	600,000	15,887,500 <i>(15,200,000 + 87,500 + 600,000)</i>
Aug 2019	87,500	607,500	16,582,500 <i>(15,887,500 + 87,500 + 607,500)</i>
Sep 2019	87,500	615,000	17,285,000 <i>(16,582,500 + 87,500 + 615,000)</i>
Oct 2019	87,500	622,500	17,995,000 <i>(17,285,000 + 87,500 + 622,500)</i>
Nov 2019	87,500	630,000	18,712,500 <i>(17,995,000 + 87,500 + 630,000)</i>
Dec 2019	87,500	637,500	19,437,500 <i>(18,712,500 + 87,500 + 637,500)</i>

With the estimated coins generation table above, we might consider to implement third halving and forth halving in future if necessary.