FreeCash

A Free-Evolved Electronic Currency System

V0.2.2

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1. Background

Cryptocurrency is a new currency form, it can overcome the shortcomings of inflation, intermediary costs and exchange costs of the current fiat currency system, providing an endogenous value circulation system for the Internet economy and becoming a common currency in the global market.

Since the late 1980s that Timothy May, David Chaum, Dai Wei, Adam Back, Hal Finney and the others have either proposed or experimented on private and decentralized cryptocurrency, which is built based on asymmetric cryptography and Internet technology. After 20 years of trial and failure, it was not until mid-2008 that Satoshi Nakamoto released Bitcoin: A Peer-to-Peer Electronic Cash System, used a series of technology that has been attempted by previous developers to build a highly decentralized Bitcoin system. After 10 years running, the basic framework of Bitcoin has proved to be very strong and has laid a solid foundation for the success of cryptocurrency.

However, the evolution of the currency framework is a long-term process. The earliest cast tokens were minted 2700 years ago, replaced by convertible paper money in 1700. However it was not until another 700 years did the inconvertible paper money come out. Since the 1960 that electronic currency has appeared, paper money is still not replaced by it after 80 years. It is also a long-term evolution from fiat currency to cryptocurrency system.

Although a lot of people thought Bitcoin was great enough to become the only successful cryptocurrency. But more and more people have changed their minds and attempted new directions with the development of cryptocurrency.

In 2012, Peercoin, based on Proof of Stake (PoS) emerged;

In 2014, BitShares, based on DPoS was born;

In 2015, Ethereum, which is focused on the Smart Contract emerged;

In 2015, the concept of blockchain rose and the application of non-token blockchain started;

In 2016, Bitcoin resulted in congestion and the scaling debate turned white-hot;

In 2017, Bitcoin failed increasing scale and its market value dropped from 90% to 40%, which led to the big ICO wave and public chain war;

In 2017, Bitcoin split to BTC, which is positioned as crypto gold and BCH positioned as electronic currency;

In 2018, BCH encountered attack from fundamentalism, when the later one failed it split to BSV tried to increase the block size radically.

All of them have proved that cryptocurrency needs a long way to explore. Along with the continuous expanding of the market scale and influence, its technology, economy and ecosystem will be more and more complicated, new problems will emerge as well. Right now, decentralized cryptocurrency is facing the challenge from consensus mechanism,

development centralization, hashrate centralization, direction of differences, route of differences, idea of differences, performances versus security and the governance of centralized community, etc.

All those problems indicated above have showed that the road to success in Cryptocurrency would never be unimpeded. Satoshi opened the door but the roads behind it still need pioneers to explore and choose their own directions. FreeCash is one of the explorations based on this understanding and recently focused on the problems for the divergences and splits.

2. Positioning

Free Cash development goal is: a free-evolved Electronic Currency System. FreeCash follows the principles as follows:

2.1 Division of Labor: Focus on the Peer-to-peer Electronic Cash

Structure, function, and performance are tightly related, proper protection to the structure is necessary to reach a higher performance but with multi-functions brought together, this will not only increase the risk of structural complexity but decrease the efficiency because of the functional interactions. The decentralized nature and market economy have evolved a complex but stable ecology through division of labor and collaboration, as should the decentralized crypto-economy. decision of labor and collaboration from decentralized nature and market economy as well as decentralized crypto-economy.

In the split between Bitcoin and Ethereum the account structure, data structure, and confirmation time designed for Bitcoin is hard to adapt to Smart Contract, however, for Ethereum the complexity of Smart Contract has reduced the systemic stability and currency function. It is impossible to succeed in an omnipotent system with a complex structure, versatility and excellent performance beyond the development stage of crypto economy.

Therefore, FreeCash is positioned as the easy and convenient peer-to-peer electronic cash, focusing on decentralized common currency, mainly through market mechanisms to cooperate with the other cryptographic applications, and becomes part of the future crypto-economy in the division of labor and collaboration.

2.2 Inheritance: Based on The Framework of Bitcoin

The decentralized monetary base framework of Bitcoin has been tested over 10 years and become the most stable decentralized currency. After the Bitcoin Block Size Controversy, its transaction and block structure had a substantial change by Segregated Witness also known as SegWit, which tried to take full payment functions through Lightning Network. It has turned the direction of Bitcoin's development from Peer-to-Peer electronic Cash to Settlement Network, and this change needs time to test it.

FreeCash adopted a more conservative development strategy inheriting the technical framework and the development idea of evolutionism. It is not only safer technically, but optimizing user entry barriers to reuse the accumulated infrastructures from Bitcoin and Bitcoin Cash maximally.

The concept of free cash began in early 2017. Bitcoin Block Size Controversy has exposed the problem that Nakamoto's

original framework was not able to fix the centralization of developer team, afterward, Bitcoin Cash temporarily solved the problem through a hard fork but the governance framework did not get optimized. meanwhile, the hard fork brought new challenges. Like the saying "too big to fail", it is really hard for Bitcoin Cash community to have a consensus if they only make non-essential improvement. FreeCash as a newborn system is going to provide a test field for evolution of Bitcoin Cash and to become a part of the evolving Bitcoin ecosystem.

2.3 Evolution: Continuous Improvement for existing and upcoming problems

Money is a complex socio-economic system. The new currency form needs to find problems gradually in a long term to make adaptive improvements. Nakamoto built Bitcoin on the basis of the previous 20 years of cryptocurrency exploration. Since then, Bitcoin has been facing new problems for 10 years, far beyond the scope of Nakamoto's personal ability. It is the decentralized framework that helped Bitcoin in 10 years, when Nakamoto left the team, the pooled wisdom was gradually developed and expanded.

Bitcoin mainly solved a series of technical problems on the basis of Nakamoto's framework in 10 years, after 2014 what the divergence has exposed is more about economic and political as well as cultural problems and haven't formed a new solution mechanism yet. Focused on these problems, FreeCash is dedicated to make a careful and concise adjustment on Nakamoto's framework, trying to solve the problems to have more harmony of interests, efficient decisions, and culture with the framework.

Fortunately, cryptocurrency has already presented a competitive situation that FreeCash has no need to build a new framework, but it is necessary to use the strategy and technology of the competitive coin tested by market for reference, and continue to explore and adapt to technical and institutional improvements in market demand.

2.4 Participation: Participate More Easily and Provide Intensive

Decentralization is the soul of cryptocurrency. Currency is the lifeblood of the economy, it is too important to rely on either a specific person or an organization, however, the center itself will bear significant conflict of interest and economic fluctuation while any point of failure has a huge systematic risk, this is how Bitcoin and the other cryptocurrency failed before. Now, the most reliable centralized currency is the fiat currency managed by the monetary authority, but it also has problems with the continuous inflation, exchange cost, and the market intervention, this is why Bitcoin appeared.

Therefore, FreeCash will deepen the decentralization that Bitcoin initiated, to encourage and attract more people from different fields into the ecosystem to participate. In order to reduce its technology cost, FreeCash is based on the technical framework and infrastructure of Bitcoin and Bitcoin Cash; by building a new chain could reduce the cost for

users to obtain and use it. At the same time, FreeCash has financial incentives for contributors to form sustainable public participation and support with the help of endogenous contribution funds.

2.5 High Efficiency: Improve the Efficiency of Evolution and Determination

The two splits of Bitcoin and the rise of centralized Cryptocurrency exposed the major problems faced by centralization. Public decision making is difficult and inefficient, which are mainly shown as follows:

1) It is hard to coordinate with the community when a significant divergence happens. In particular the Block Size Controversy had last more than 2 years and ended up with congestion for a year.
2) Free ride phenomenon is serious when dealing with public affairs. For instance, the Bitcoin Cash community used to overly rely on BitMain in the early time.
3) It is hard to reach a consensus, because of the asymmetric information and a high threshold of profession.
4) It is also hard to organize a defense when the community is facing an organized attack. For example, nChain took the opportunity when Bitcoin Cash was having the hard fork update to make a well-planned attack causing a big loss to the ecosystem of BCH

FreeCash establishes the Contribution Funds through the way of new currency rewards. On this basis, it establishes a community governance structure and governance coordination organization, explores the effective governance structure of the decentralized community, improves the efficiency of public decision-making, and achieves efficient system evolution in a competitive environment.

2.6 Freedom: Realize Free Collaboration and Free Competition

Freedom is the final goal of human beings, which whether Karl Marx or Friedrich Hayek seeks for but in different ways. The soul of FreeCash is also freedom, it achieves free collaboration in the decentralized way and achieves free competition in the form of forked coexistence.

The essence of FreeCash is the endogenous currency in the market economy, it
1. Focuses on the electronic cash function and collaborates with cryptographic applications of other functions through the market.
2. Realizes the harmony of interests and the voluntary collaboration inside the system with the help of Nakamoto's framework and the Contribution Funds, therefore, the users could enter and exit freely, meanwhile, it guarantees a high efficiency to make decisions.
3. Realizes the exploratory evolution from different orientation by forking if there is significant divergence, realizes what Darwin calls "Survival of the fittest" through a free competition in the market.

FreeCash is going to explore and realize the road to currency freedom step-by-step through free collaboration and free competition, to make its own effort for constructing the global free crypto-economy system.

3. The Features of FreeCash

The development of FreeCash is a long-evolution process, based on the development experience of cryptocurrency and FreeCash's positioning, its first version (FreeCash V1.0) has features as follows:

3.1 The Name and The Unit

The Chinese name for FreeCash is "自由现金", abbreviated as FCH;

The currency unit is " f ", which is the initial letter of FreeCash;

And the future common unit of small payment (sixth place after the decimal point) is recorded as " $\mathcal{C}$ ", which is the first letter of "cash".

And the smallest currency unit (8th decimal place) is "s" to pay tribute to Satoshi Nakamoto

3.2 SCHNORR Signature

SCHNORR signature is known for its higher efficiency and stronger extensibility than Elliptic Curve Encryption. BTC is planning to put SCHNORR on line, and BCH has already udated SCHNORR on May 15th 2019. But each of them has to accept the old signature algorithm to make sure the legality of the previous transactions, which would increase the systematic complicity and the difficulty to adapt the SCHNORR. As a new chain, FreeCash will abandon using Elliptic Curve Encryption to fully adapt SCHNORR.

3.3 POW Consensus

Proof of Work Consensus (PoW) improved by Adam Back and Hal Finny from their exploration and was applied in Bitcoin by Nakamoto successfully. It provides a concise way to build a decentralized accounting currency issued fairly and transacted safely, which is the key to success in cryptocurrency's early exploration. Bitcoin has spent 10 years testing its reliability and FreeCash is going to adopt it in Nakamoto's framework.

3.4 SHA256 Mining Algorithm

In the past, the PoW cryptocurrency has changed the mining algorithm, such as Litecoin to scrypt algorithm, in order to avoid the 51% attack threat of the Bitcoin SHA256 mining algorithm. The addition of reorganization protection eliminates the 51% attack threat, allowing FreeCash to continue using SHA256 mining algorithm to better utilize the long-term accumulation of Bitcoin and Bitcoin Cash to form the mining infrastructure.

3.5 Confirmation time

PoW of Bitcoin set a 10-minute block time in average, which is accorded to the status of network and computing in 2008, however the status of hardware now could have block transformed and confirmed much faster which support the shortening of the confirm time. There are more Cryptocurrency than Doge and Grin adopted 1-minute block time, which runs stably and provided a good user experience. FreeCash also adopts 1 minute confirmation time through the tests.

3.6 Reorg Protection

The biggest threat to PoW is the 51% attack to reorganize blockchain which would cause double spend loss and market panic. A public, continuous, and organized 51% attack to Bitcoin Cash in November, 2018 was successfully resolved from adding reorg protection and rolling 10 block checkpoints to BCH, and finally won the hash war. Therefore, FreeCash is going to set reorg protection for 30 blocks in the event of 51% attack, it also ensures the safety for the large transfer in 30 minutes.

3.7 Difficulty Adjustment Algorithm (DAA)

Due to the framework of Nakamoto, the difficulty of mining is adjusted every 2016 blocks (about two weeks). When multiple chains are run in the same mining algorithm, the computing power will all flow into the chain with relatively higher returns in which it blocks more frequently while it can't block in another chain. After the difficulty adjustment, the calculation power is in reverse. In this case, the small chain cannot survive. To this end, Bitcoin Cash has been adjusted to Difficulty Adjustment Algorithm (DAA) to solve this problem, and Free Cash inherits this algorithm.

3.8 No Premining and ICO

The Governance Fund will continue to produce from each block, addressing public funding needs, and thus does not require premining or Initial Coin Offering (ICO). Premining and ICO have legal risks on the one hand, and on the other hand, a lot of them made use of people's ideal feelings to collect money and then declare that they would give coins away to the community. To this end, they leave no funds but what they called "decentralized" community. However, the Governance Fund produced from each block will provide a more sustainable guarantee of what it needs.

3.9 Governance Fund

The decentralized community also needs public decision-making. The Block Size Controversy reflects the inefficiency of the public decision-making of Nakamoto's framework and the lack of developer incentives. BCH hash war reflected the weakness of the decentralized community which is lack of a public decision-making mechanism when it is attacked by the centralized community. A basic premise for making public decisions is to use funds for public decision-making and public affairs. To this end, FreeCash breaks through Nakamoto's framework, generating the Governance Fund when Coinbase provides mining rewards.

3.10 FreeCash Reduction

Every 210,000 blocks (approximately every 4 years) since Bitcoin's inception, the reward that miners receive for mining a block halves. Having means the new currency supplied in markets reduced 1/2, it would give a price shock and form into a periodic bear and bull market in every 4 years as the market demand is changing continuously. To smooth this fluctuation FreeCash reduces mining rewards by 20% every year from the first beginning of 25F each block, and the Governance Fund halves annually from 25F each block. The reduction function is considered to adapt to the pressure of the operating funds in the early stage as well as the trend of higher currency prices in the later period.

3.11 Stabilize Issuance in 20 Years

The last Bitcoin will be mined in 2140. As block reward goes to zero, miners will obtain an income only from transaction fee. Considering that the transaction fee fluctuates with market demand widely and Bitcoin failed to update its block size makes it is really hard to increase the volume, thus the transaction fees would not be enough to support the incentives for miners. FreeCash is going to stop reducing the block reward at the height of 12,096,000 blocks (approximately in 20 years) to avoid the problems and to provide the basic fund support for a long-term community governance. Then each block reward is 0.23F, and 0.000012F for Governance Fund, which provides the stable incentives to miners and the Governance Fund. By 1/1000 annually increased in total number of FreeCash, there will be no inflation worries.

3.12 Total Circulation

The total number of FreeCash, as mentioned earlier, has an asymptote at 100 million in 20 years. Even though it stops reducing the reward in 20 years, by 1/1000 annual increasing rate the total amount is only 108 million F in 80 years. Thus, the total circulation of FreeCash is 100 million F.

4. Operations

4.1 Developer Composition

Decentralization is the source of lasting vitality for cryptocurrencies, and the operation of Free Cash is also a combination of individual behaviors of volunteers who volunteer to participate in the trial. We don't have a fixed team. People who understand the cryptocurrency, agree with the concept of FreeCash are joining continuously while the others leave for various reasons. In general, the participates in FreeCash paid a lot attention to free revolution and they are experienced, but the free cash route is very different from the current trend. It is not easy to understand and agree with it.

These voluntary participants do not intend to promote their names. In a decentralized cryptocurrency system, personal social identities are not important, FreeCash does not need individualism, and participants do not intend to earn a reputation by FreeCash. Everyone is involved in doing what they think is right and can leave of his own accord. This is the basic guarantee for decentralization.

Participants in FreeCash choose whether to be anonymous according to their preferences. Most participants are not difficult to be found, nor are they worried about being found. After all, Nakamoto has taken on most of the risks of creating a new monetary system for us. Some people have tried to prove that they are Nakamoto, and more people use their own credit endorsements to issue cryptocurrency, which means that issuing a new cryptocurrency is no longer a dangerous thing. FreeCash is not going to ICO or premining, but based on the contribution of each person, the endogenous monetary incentives for free cash afterwards, which also avoids the individual risks of the participants.

In the early development of free cash, there are fewer people who understand FreeCash, and there are more design and development problems, and it is difficult to obtain economic returns. Therefore, it needs some people to develop and operate FreeCash relatively concentrated for ideals. As more and more people understand and participate, development operations will become more and more decentralized. The successful experience of Bitcoin also tells us that decentralization is not a state, but a process. We strive to gradually increase the decentralization of FreeCash in accordance with system development and market demand, and achieve safe and stable growth of social value of FreeCash.

4.2 The Source of Fund

Even in decentralized communities, there are public affairs that need to be dealt with. The biggest problem facing decentralized cryptocurrencies is the issue of community public governance, and public Governance Fund is a prerequisite for solving it.

The experience of Bitcoin, as well as the development of many important innovations in history, suggests that early promotion requires belief and ideals, but once a broad economic impact is generated, the harmony of economic interests is the key to innovation. In the block size controversy, developers lack economic incentives to pursue anarchist ideals

regardless of market demand. For instance, BCH had a huge loss under the well-organized attack when it was lack of the public fund and an efficient organization.

One of the original intentions of FreeCash design is to solve the public governance problem of decentralized communities. To this end, in addition to the mining reward, the Governance Fund was set up to solve the problem in the simplest way and improve the economic incentive compatibility mechanism of Nakamoto's framework.

In the early days of FreeCash, even the mining reward could not be a real economic incentive due to lack of market valuation and trading depth. Without premining and ICO crowdfunding we need participates to contribute your ability, energy and time based on the ideal we shared, to reduce the cost of running the system, on the other hand, we also accept voluntary contributions from the participants.

In the case of a gradual stabilization of the FreeCash system and being accepted by the market, the Governance Fund will cover major operating expenses. As the degree of market recognition increases, it will reach a peak, supporting to complete the main construction of its system and ecosystem. The Governance Fund will be halved annually, with rapid decline of the amount. After 20 years, the system will mature, and 6f will be used to support the daily operation and maintenance of the system and ecosystem.

4.3 The Use of Fund

FreeCash Governance Fund is used for public spending and to motivate people who contribute to the development. It mainly includes development incentives, organizational funding and popularization of science funding.

Development incentives include the development of underlying systems and peripheral applications, including incentives for operational development teams and contributions to volunteer and anonymous developers. For Bitcoin, Bitcoin Cash and other various cryptographic applications referenced in the development, some FreeCash will be paid from the Governance Fund to show our respect and gratitude.

Organizational fund is used to establish online and offline community organizations to maintain the necessary costs of the public governance, including coordinating the organization's daily expenses, convening meetings for public decision-making, and compensation for counseling experts in community.

Popularization of science fund are used for the popularization and promotion of FreeCash, cryptography technology, cryptocurrency, crypto-economy and other related knowledge, including online and offline activities, the development of popularization of science websites or tools, and FreeCash faucets.

Anonymous contributors are an important force in the creation and development of decentralized cryptocurrencies. In a decentralized community, the work of anonymous contributors based on ideals and interests has unique value and is the ultimate guarantee of system security. The Governance Fund will do its best to support them, respect and praise their willingness to accept no funding.

4.4 Contribution Assessment

The use mechanism of the Governance Fund does not affect the safe and stable operation of FreeCash system, but it will affect the decision-making and development progress of the community, thus affecting the evolution of the system. There is currently no mature template for the management of funds in the decentralized community, which needs to be explored. FreeCash will establish a Governance Fund use mechanism in accordance with the following principles:

Open and transparent principle. Openness and transparency are the most important principles for ensuring fairness and efficiency. The Governance Fund is generated in the new currency issued which is open and transparent. The use and distribution of Governance Fund will also be recorded on the chain, which is traceable and verifiable.

Post-assessment principles. In order to improve efficiency, reduce disagreements and iterations, the aided activities are generally funded after the activities are completed or staged, and the results and processes of the activities are assessment.

Professional assessment principles. In order to ensure the efficiency and fairness of the funding, the assessment of the contribution will be based on the characteristics of the activity itself, and conduct to selected professionals.

The principle of democratic concentration. On the basis of professional assessment, the distribution plan will be determined in a democratic way to ensure fairness, but when the democratic mode is too inefficient, the Governance Fund private key holder will have the final decision.

5. Join FreeCash Experiment

As a decentralized cryptocurrency, everyone could join FreeCash. As a complex social system, it also needs expertise in all areas. FreeCash will encourage people from all sectors to join in ways such as lowering technology thresholds, reusing mature infrastructure, and motivating contributors. Join FreeCash Experiment, you can:

Learn Cryptocurrency. FreeCash has the same underlying structure with the mainstream PoW currencies such as Bitcoin, and the materials available for you to learn is various and mature. The FreeCash history data is very small, which is easy to install and synchronize, the transaction fee is extremely low, and the learning and experiment can be started with low threshold and low cost. The knowledge learnt is also easily extended to other PoW mainstream currencies such as Bitcoin and many blockchain applications.

Use FreeCash. Under the precondition of mastering the basic knowledge and being able to securely hold and use the private key, you can try to obtain and use FreeCash, accept it paid by others or pay to others. Since FreeCash is a new cryptocurrency starting from nothing, the scope of use is also from nothing, so we need you to use it. Meanwhile, skilled use of FreeCash also helps you safely use Bitcoin and Bitcoin Cash.

Develop related applications. Qualified participants can try to develop FreeCash-related applications. There are already many of these applications related to Bitcoin, Bitcoin Cash, and also other cryptocurrencies. Most of them have open source code that can be easily migrated and expanded. This is also a very interesting thing. Similarly, the low threshold of FreeCash and low cost will also help your development, and the accumulated experience will be easy to use for application development such as in Bitcoin and Bitcoin Cash.

Try a new orientation. Cryptocurrency is still in the early stage of exploration. There may still be many divergences in orientation, function, route, etc. The root cause of the divergences lies in the uncertainty of the future and it needs to be tested slowly in the markets. Multi-orientation exploration and competition are the fundamental driving force for the survival and growth of cryptocurrency. Under the premise of free consensus, FreeCash supports exploration in different orientation, cherishes divergences that are difficult to eliminate, and encourages exploration of forks.

In short, FreeCash is a test field of cryptocurrency. We look forward to standing on the shoulders of giants and exploring the higher-level freedom of mankind, along with more people who love freedom, persist in reason proportion, and pursue a better life.

Satoshi Nakamoto opened the door for freedom. We have to find the way.