The Gauss System

Whitepaper

https://gauss.cash

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Abstract

In this paper, we introduce Gauss (GS), a combination of Proof of Work (PoW) mining and liquidity mining. Unlike Bitcoin, GS adopts Conditional PoW (CPoW) which could effectively prevent hash power monopoly from the beginning. The Gauss Decentralized Deposit Smart Contracts Module is the core component of the Gauss CPoW DeFi system. By altering the liquidity mining distribution ratio, GS allows participants to trade for the time value of assets.

Contents

1 Background

Since the implementation of Bitcoin in 2009, there has been a growing shift away from traditional, government-backed currencies and financial systems towards modern payment systems based on cryptography, which offer the ability to store and transfer funds in a trustless and secure manner. The increased transaction times, large fees, and questionable network scalability have raised questions about the practicality of Bitcoin as an everyday currency [1]. Many other coins have been invented and aim to make up for Bitcoin shortcomings ended in failures.

In this paper, we introduce GS, a new Conditional Proof of Work digital assets which could effectively prevent hash power monopoly and miner short. Moreover, GS innovatively brings into liquidity mining to allow participants to trade the time value of assets.

2 Industry Development Obstacles

The digital asset mining industry has grown into a huge industry with an annual output value of more than 4 billion US dollars. There are three main problems in the digital assets mining industry:

2.1 Traditional PoW problems

Mining machine: Miners invest a lot of money to purchase mining machines. The maintenance cost of mining machines is high and the depreciation rate is fast. Not only the natural depreciation but also the accelerated depreciation caused by the mining rig manufacturers. The main profits of the mining industry are attracted by several leading mining machine manufacturers. As the main participants in the mining industry, the miner group hopes that more profits will remain within the miners;
Electricity fee: miners are required to invest large funds to pay for electricity bills. When the date of payment of electricity bills comes, the miners must sell the digital assets they dig out in exchange for fiat currency and pay electricity

bills. Even if the market is sluggish, miners are forced to sell. The electricity bill is the sword of Damocles hanging above the miners. The behavior of miners selling digital assets and paying electricity bills has become an unconscious and powerful short-selling force in the digital asset market, which ultimately damages the interests of miners. Electricity charges not only put a heavy burden on miners but also cause a huge amount of energy waste. According to incomplete statistics, the annual electricity consumption of the global mining industry has reached 70 billion kWh. The power consumption of the mining industry has attracted the attention of governments, media, and environmentalists in many countries.

2.2 Cryptocurrency finance problems

In the digital asset financial services industry, to tap the time value of digital assets, there are two main problems with existing products.

Low yield: DeFi products on the market have high principal security but low yield, and the annualized yield is usually less than 5%;

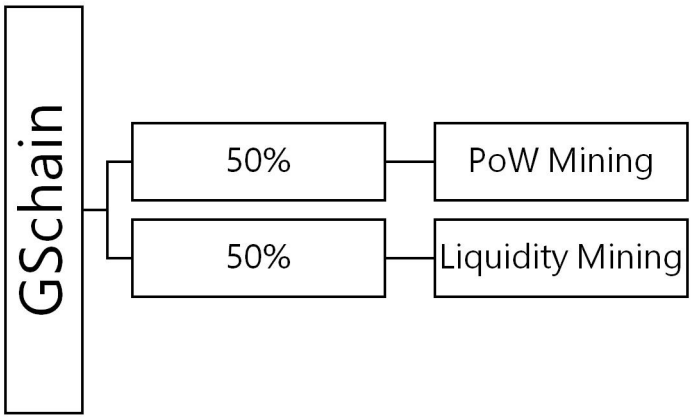
Capital efficiency: Miners spend a large portion of funds to purchase mining machines, but lack of effective financial instruments along with low capital efficiency, make it difficult to obtain loans through mortgage of mining machine property rights. At the same time, the digital asset financial services industry, which is close to the digital asset mining industry, has huge amounts of sleeping assets and does not or rarely create due time value for holders.

Principal security issues: The digital asset financial services industry is flooded with many high-yield scams, centralized design, no collateral, and the principal risk is extremely high. The risk of this product often does not come from a hacker attack, but it is a drumstick scam from the beginning of the design.

3 PoW and Liquidity Mining

Gauss blockchain mining consists of two parts, namely PoW and Liquidity. Apart from traditional PoW mining, this paper will bring the innovative

Discount PoW and Conditional PoW. After Foundation, the distribution plan is as follows:



GSchain Reward Distribution

3.1 Gauss Dual PoW Mining

In general, people could reckon Gauss blockchain mining the same as Bitcoin only with different mining rewards mechanism. Gauss blockchain runs a dual mining system, namely Discount PoW mining (DPoW) and Conditional PoW mining (CPoW). In the following part, we will introduce each system respectively.

3.1.1 Discount-PoW (DPoW)

Under Gauss DPoW system, miners mine like Bitcoin but only get 5% of the normal reward, namely discounted reward. The remaining 95% of the rewards automatically enter the Gauss Foundation.
Example:
Assume mainnet hash power maintains stable, Gauss blockchain rewards PoW 10GS/M per day, miner A makes no deposit on Gauss blockchain and arrange 1M hash rate and mine 24 hours. At the end of the day, miner A will be rewarded 0.5GS(5%), and Gauss Foundation gets the rest 9.5GS(95%).

3.1.2 Conditional-PoW (CPoW)

CPoW builds upon traditional PoW, in short, to start mining GS, miners are required to obtain a certain amount of hash rate quota first. Miners have to deposit GS on mainnet to get hash rate. In the early stage, Gauss requires approximate 4GS deposited on Gauss mainnet to obtain 1M hash rate with 100% mining reward.
Example:
Assume mainnet hash power maintains stable, Gauss mainnet rewards PoW 10GS/M per day, miner B deposits 4 GS on mainnet, and arranges 1M hash rate mine 24 hours. At the end of the day, miner B will be rewarded 10 GS. Bitcoin blockchain total hash power has increased dramatically since its born and reached 171B nowadays [2]. Like Bitcoin, GS price and total hash rate increases are predictable. With 100% mining rewards, CPoW will attract most of the GS miners in the community. Hence the 4GS/M deposit rule may need to be altered as needed. The GS Foundation delegates this power to the community.

3.2 Dual System Superiority

In this part, the paper will explain problems solved by Gauss blockchain and its unique advantages.

3.2.1 Problem Solved

Hash power monopoly has always been criticized by miners, which is the main reason many high-quality projects cannot run for long terms [3]. There are even some organizations self-proclaimed as new coin killers and they could dominate hash rate quickly after mainnet released. In this case, those so-called new coin killers obtain majority coin in the early stage and smash. Also, small miners and investors find it hard to participate in new projects. With Gauss dual system, especially CPoW mechanism, miners are required to deposit GS first to obtain higher rewards, otherwise, miners only get 5% rewards. Gauss no premine and early scarcity make it theoretically impossible

for several big miners to get majority GS. Meanwhile, GS dual system leaves more space to retailer miners and investors.

3.2.2 Deflation Mechanism

As mentioned above, there is no premine on Gauss mainnet. Also, miners need to deposit GS to participate in CPoW mining to get 100% rewards. Unlike other coins, CPoW system makes GS circulation a natural deflation mechanism. Moreover, for the first time, Gauss could not only avoid miners short, buy may effectively mobilize miners purchase index. The CPoW mechanism exacerbates scarcity and pushes GS long-term and benign development.

3.2.3 Community Interaction & Currency Attribute

Unlike many other digital assets, miners and investors are isolated, GS community could strengthen miner and investor interaction [4]. Investors are more willing to take risks compare to pure miners, while miners are more professional in mine and maintain mining rigs. It is most likely miners will rent GS from investors to deposit and participate in CPoW. GS Foundation will build a system to enhance that cooperation and ensure security.
Example:
Under 10GS/M PoW mining rewards and 4GS/M deposit. miner C participates in PoW mining and has 10M hash rate and no GS, GS holder A has 40 GS and no mining rigs. miner C and holder A cooperate on pre-decided distribution ratio, say miner C gets x% (x should great than 5 under reasonable circumstances).

	BEFORE COOPERAATION	AFTER COOPERATION
MINER C	5GS	100*x%
HOLDER A	0	100*(1-x)%

Table 1: Miner & Investor Interaction, Currency Attribute
As the table shows, both miner and holder increased rewards after

cooperation. In this process, investors and miners cooperate and could use GS as payment currency. For the first time, GS will be used as a currency to pay for labor. Moreover, full communication within community could enhance consensus.

3.3 Gauss Liquidity Mining

Blockchain technology provides an opportunity to ease the public growing frustration with centralized financial systems. Satoshi Nakamoto created Bitcoin with this goal in mind. This paper introduces GS Platform (GSP), which establishes money markets with supply-demand based distribution factor, allowing users to exchange the time value of digital assets.

3.3.1 Liquidity Structure

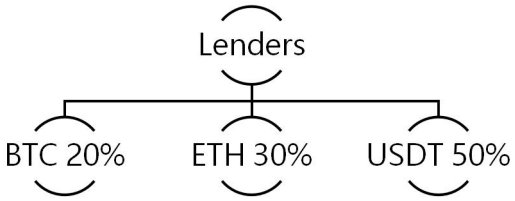
Gauss mainnet rewards 60,000 GS every 24 hours, 50%(30,000GS) of the rest GS will be automatically allocated as liquidity mining reward. Rewards will be distributed equally between borrowers and lenders sides. Reward distribution is calculated and distributed every block (every 5mins).

Liquidity Mining Reward Distribution

Compare to traditional banks, on GSP, individual lenders and borrowers could reach agreements without negotiation. Participators need to mortgage assets before borrowing, and GSP implements a 150% excess mortgage margin policy.

3.3.2 Distribution Incentive

The initial three accepted underlying assets are BTC, ETH and USDT. In the beginning, the reward distribution factor of lender sides set as follows:



Lender Reward Initial Distribution Factor

Borrowers initial distribution factor same as the lender side.
For each block, lenders reward equals to:
$Lender\ Reward = Distuibution\ Factor * 30{,}000 * (Deposit/Pool\ Fund)$
And borrower reward equals to:
$Borrow\ Reward = Distribution\ Factor * 30{,}000 * (Loan/Total\ Loan)$
Chu
Example:
Under the above distribution ration, lender A supplies 500USDT to GSP with total a 1000USDT storage in GSP pool. Assume that the USDT pool remains stable throughout the day (most unlikely), lender A gets
50%*30,000*(500/1000) = 7500GS.
This distribution factor is to ensure balance storage and ensure the smooth borrowing on GSP. The distribution factor can be altered through community governance. The goal is not to reduce GS distributions or hamstring yield farmers, but to move liquidity out of the low liquidity tokens/coins into more useful and in-demand assets, like stable coins USDT.

3.3.3 Liquidation

On GSP, lenders could redeem at any time. There is no repay period for borrowers. Liquidation will occur when user borrowing assets value exceeds their borrowing capacity due to the value of deposit falling, or borrowed assets increasing in value. The GSP adopts a 150% liquidation ratio, to protect the lender interests and ensure there is always sufficient funds to cover the

value of all outstanding debt, GSP automatically triggers liquidation once threshold has been reached. During the liquidation, GSP charges liquidation penalty, and borrower deposit asset will be auctioned to cover corresponding fund pool, residual returns to borrower account.

3.3.4 Oracle Feeds

GSP will select a price feeds portfolio among top exchanges. In the beginning, developer will select 5 exchanges (Gate, Bittrex, Huobi global, Binance, Kraken) and ensure that each asset has at least three exchange indexes. The price feeds portfolio is used for calculating the value equivalent of assets and determine collateral requirements and borrowing capacity. GSP will delegate the right of whether to list or delist certain exchanges to the community.

3.3.5 Primary Use Cases

The basis case would be for lenders to generate interests and help borrowers to participate in ICO as most projects accept ETH as payment method.
As a money market, borrowers could use GSP as a tool to short certain coins. A typical way would be borrowing coin from GSP and sell on exchange and expect to profit from plunge.
Under the Gauss DeFi System, GSP would be an extra method to obtain GS and participate in CPoW more efficiently.

4 Gauss Decentralized Deposit Smart Contracts

The Gauss Decentralized Deposit (GDD) Smart Contract is a smart contract that runs on the Gauss mainnet and is used to establish a margin relationship between mainnet and users. Each user's wallet account has two categories: normal balance and deposit balance.

4.1 The GDD interaction process

Step 1: Creating the GDD user first creates the GDD account and fills in the deposit target address and unchangeable unique redeem address on the Gauss Wallet user interface.
Step 2: Depositing GS asset user then sends a transaction to the GDD. At this point, the GDD is considered deposited.
Step 3: Submitting a redeem request when user wants to withdraw the deposit, they can submit a request to retrieve the GDD deposit. There are two options for retrieving: Normal Release and Emergency Release.
Emergency charges 35% of the mortgage amount as the redemption fee;
Step 4: Withdrawing deposit and closing the GDD when the GDD user submits a request to redeem the deposit, the Gausschain automatically starts the GDD ending process. The GDD ending process will ensure global data security and transfer the deposit to the unchangeable unique redeem address. At this point, the GDD life cycle has ended.

4.2 GDD Emergency Release

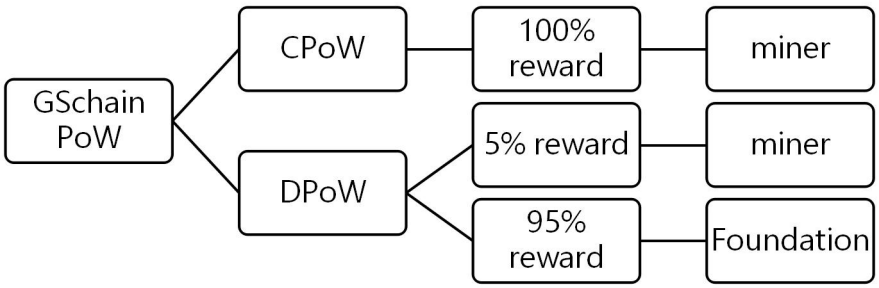
On Gauss mainnet, the hash power is calculated based on the average hash power of a certain amount of days. Users may require emergent withdrawal due to price fluctuations, or other reasons. If the user chooses to quickly release the deposit and the deposit will be completely within one day along a 35% fee will be charged. The fee will be destroyed directly on Gauss mainnet. Emergency Release is to reduce GS circulating supply and suppress market fluctuations.

5 No Premine

Gauss mainnet is designed with no Premine, which means all participates include early developers mine fairly. Although some argues that premine is necessary to reward early miners and developers as they are core to project success [5]. However, it is fundamentally against decentralization which is a key tenet of cryptocurrency-the idea that no single person or organization is

in control of a coin [6]. Hence there is no premine on Gauss mainnet. Gauss distribution plan and dual mine mechanism could help to fund project developers.

GSchain will linear vest 5% of GS Token (5,000,000GS) to development team. This provides the developer a stable fund to operate and maintain the mainnet and implement development plan. Moreover, under the dual mine mechanism, due to the GS natural scarcity, especially in the early stage, most of miners would have to choose DPoW, which means Foundation gets early accumulation easily. The situation will not last long and the quantity will not threaten decentralization. Most miners will gradually switch to CPoW and DPoW should exists to some extent. For the GS PoW reward, the distribution sets as follows:



PoW Reward Distribution

6 GS Governance

Community is the backbone of GS development. Team has developed the governance system to facilitate community vote on key issues. Governance is done at the system level through election of an Active Proposal by raised GS community . The Active Proposal is the smart contract that has been empowered by GS voting to gain root access to modify the internal governance variables of the Gauss System. After each vote, Gauss team will need up to three days to update the system and make the motion effect.

6.1 Dual Mining Governance

GS holders can vote to do the following:

1. Flexible CPoW triggers timing.
2. CPoW deposit rate (default approximate 4GS/M).
3. DPoW reward rate (default 5%).

Note:

- GS Foundation waives voting rights and Foundation holding does not count for circulating supply in this case.
- Only GS holders can submit proposals
- 40% < total supply vote involvement is required

6.2 Liquidity Mining Governance

In the early stage, GSP adopts centralized control of the distribution factor and over time, will transition to complete community control. GS holders can vote to do the following:

1. List/delist coin or token market.
2. Choose the set of Oracle Feeds.
3. Alter the distribution factor.

Note:

- GS Foundation has the right to vote and Foundation holding counts for circulating supply in this case.
- Anyone, not only GS holders, can submit proposals.
- 40% < circulating supply involvement is required

7 Tokenomics

GS chain total supply is 200,000,000(GS Token 100,000,000 and GS Coin 100,000,000). GS Token is equivalent to GS Coin and one-to-one proportional exchange for each other. GS Token is designed to endue users priority in CPoW mining and allow users to participate liquidity mining.

GS Token Distribution:

Total GS Token Supply: 100,000,000

Private 1: 2,500,000 2.5% (0.04USDT/GS, Linear Vesting)
Private 2: 2,500,000 2.5% (0.04USDT/GS, Linear Vesting)
Team: 5,000,000 5% (Linear Vesting)
Ecology: 2,500,000 2.5% (Linear Vesting)
OTC Pre-Sale: 20,000,000 20% (0.05USDT, details to be released soon)
ETH-GS Pair Pool: 14,000,000 14%
Liquidity Rewards 53,500,000 53.5% (Liquidity Farming)
Note: All OTC tokens can instantly exchange for GS Coin once mainnet launched.

8 Risks

The Gauss dual PoW agreement is achieved on Gauss mainnet. It is guaranteed decentralized and completely transparent. As for the GSP liquidity mining system, there is a possibility of malicious hacking and stealing users' assets. To avoid systemic risks on the platform, GS cooperates with blockchain top security audits and bug bounties to help secure the platform.

9 Conclusion

This paper presents GS, a natural hash power monopoly resistance cryptocurrency that utilizes a novel deposit PoW mining. The mainnet requires to deposit guarantee pre-decided amount of coin to obtain high reward mining qualification. Also, GS liquidation mining builds up a money market to allows users to trade the time value of assets.

10 References

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