GMC

White Paper 1.0 of Cloud Miner

Build global 5G + blockchain data validation application cloud mine ecosystem

Build a common public chain system and related infrastructure, which is easy to use with perfect support function, high performance, rich application scene and good user experience, and related infrastructure, to build 5G block chain ecosystem combined with data affirmation application.

2020

PREFACE

Every wave of industrial change brings new opportunities and imagination to the world. The birth of blockchain technology has truly realized a brand new value transfer channel, and its application scenarios are almost unlimited. The advantages of blockchain technology undoubtedly play an important role in the digital economy and create greater value. More innovative economic models are needed in the new digital age, and blockchain technology undoubtedly provides a new possibility to truly realize the rediscovery of value. Over the course of millions of years of human development, the logic is repeated again and again of how to reduce the reuse of human resources, from the invention of stone tools, the improvement of labor efficiency, to the invention of iron, to the invention of steam engines, to the invention of computers, to the invention of artificial intelligence.

As the most important node in the social network, human beings are both the creator of the social network and the labor force driven by the network, and most of the labor force is often reused and has no value to give back. Perhaps human beings need a technology to make it possible to solve the problem. In the face of the wave of change in the digital economy, the use of resources becomes more convenient and efficient, but at the same time, it is possible to cause greater "waste" of resources, which is free, without any return on value, or even the possibility of exploitation. If the traditional social network in the digital economic network follows that human constant logic, how the value of human resources is accurately measured, so that the affirmation of the truth, certainty, price and right has become the top priority, GMC is carrying out this great social experiment!

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1. Abstract

As a decentralized value transmission system, blockchain technology was first proposed by anonymous person Satoshi Nakamoto and applied to Bitcoin. In the Bitcoin system, in order to complete a relatively complex transaction type, Satoshi Nakamoto creatively proposed a script mechanism. But when developers want to implement more functions through bitcoin scripts, they are often subject to many restrictions. To this end, Ethereum proposed by Vitalik Buterin introduced Turing complete smart contracts and EVM to make application development based on blockchain technology possible, and was praised by the industry as "Blockchain 2.0" after Bitcoin. However, both Bitcoin and Ethereum are faced with the problems of scalability and transaction delays caused by the rapid growth of users and transactions. The root cause is that the structure of the single chain in the current blockchain system makes many excellent projects lack sufficient flexibility in the face of these problems, and the development of blockchain in the field of 5G, which is naturally applicable, is also difficult.

In order to solve these problems and better combine blockchain with 5G technology, after continuous exploration and demonstration, the GMC tree blockchain technology was proposed by the senior technical team of GMC in the United States. GMC is a "main chain + multi-application support The "chain" tree structure realizes the transaction expansion and high concurrency problems that cannot be solved by the single chain structure through the unlimited expansion of branch chains. At the same time, GMC, as a 5G infrastructure, will establish multi-entity device trust and data interoperability in heterogeneous environments, creating a stable and reliable technical foundation for future 5G more complex business models. GMC DAPP is a world-leading decentralized

blockchain full-field ecosystem. Its underlying architecture technology is developed by the top technical team from Silicon Valley in the United States; it is your steward of distributed storage and anonymous transactions of digital assets, and it is also a value-added DAPP application software, such as hosting, private chat, film and television entertainment, mining pool mining, cross-border shopping, international STO, venture capital, etc.

2. The status of global 5G application

development

The communication technology from 1G to 2G can be said to be an upgrade from analog to digital, which represents the evolution of the two communication network modes; while from 2G to 3G, it is mainly reflected in the obvious increase in transmission rate; 3G to 4G transmission rate is faster And traffic tariffs have also dropped significantly. In general, the intergenerational upgrade of communication technology is mainly reflected in the improvement of communication speed and transmission rate. Communication speed and transmission rate are also the main reference evaluation standards when formulating communication standards. High generation is often accompanied by high speed and large bandwidth , Low latency and high reliability. The arrival of the 5G era is mainly the realization of these specific technical indicators. The main characteristics of 5G are ultra-high speed, large connection and low latency.

2020 is the sprint stage of 5G, and countries are accelerating the process of 5G commercialization. As 5G technology matures, many emerging industries such as smart security, unmanned driving, VR / AR, smart cities, smart homes, etc. will be greatly transformed, and 5G will change our lives and work methods and lead more Emerging application scenarios and business models, many innovations in electronic information technology in the future will mainly rely on 5G communication technology. With the unified development of 5G standards and the spectrum ecological environment, countries have accelerated the commercialization of 5G and are on the road to 5G technology Competition for cards, fierce competition.

The United States, Japan, and South Korea deployed 5G test networks in 2017-2018, and in 2019 will deploy equipment that conforms to the 5G international unified standards. Trump recently

announced a series of initiatives to stimulate the development of 5G networks in the United States. Trump emphasized that by the end of 2019, there will be 92 commercial 5G networks in the United States ready. The wireless communications industry plans to invest $ 275 billion in 5G networks Quickly creating 3 million jobs for the United States and injecting 500 billion US dollars into the economy. Apple is preparing for the launch of 5G iPhones. Three companies, Taiwan Optoelectronics, Zhending KY and Taijun, have become the first manufacturers to receive PCB orders. The EU started 5G trials in 2017 and plans to fully deploy 5G by 2025. US regulators are coordinating the 5G frequency, and the coordination of the 3.4-3.8 GHz band is the fastest; Switzerland may become one of the first countries in the world to launch 5G commercial services; Ericsson and Telefonica upgrade the famous Camp Nou stadium to 5G stadium. South Korea 's LG U + has deployed 15,000 5G base stations, with Huawei equipment accounting for 95%; Samsung is undertaking a 5G business merger and acquisition target to occupy 20% of the equipment market share by 2022; South Korean telecommunications giant SK has launched an open platform for 5G edge computing to open up to third parties to promote 5G business Change.

Relevant data predicts that with the promotion of 5G applications and consumption, global users will reach one billion levels in about five years. By 2035, 5G will create more than US $ 12 trillion in economic output worldwide; it is expected that 2020-2025 During this period, China's total economic output directly driven by 5G commercials exceeded 10 trillion yuan, and indirectly driven total economic output will exceed 24 trillion yuan; it is expected that by 2025, 5G will directly create more than 3 million jobs.

Any business or any technology can only be established if it can create value for users. As a GMC team that has been deeply involved in 5G technology for many years, it has a number of 5G patented

technologies. Facing the huge market of 5G enabling applications, the GMC team always believes that enabling blockchain projects and the real economy is an inevitable trend of technological development. The intercommunication of value "data" is an inevitable result of technological development.

In the test experiment in the United States, the GMC team verified that the transmission speed of the fifth generation mobile communication can reach 10Gbps, which is tens to 100 times faster than the transmission speed of the fourth generation communication network, the user experience rate reaches 1Gbps, and the number of connections is 1.06 million / km2, the air interface delay is 1ms, the end-to-end delay is in the order of ms, and the reliability is close to 100%. It can fully implement continuous wide area coverage, low power consumption and wide connection, and low delay and high reliability.

The members of the GMC team also include technical geeks from the Bitcoin community and elites from all major fields in the world. They are proficient in blockchain, Bitcoin bottom layer, Ethereum bottom layer, edge computing, big data and other technologies, and empower the area with 5G technology. Blockchain projects will have more advantages in data security, identity authentication, and privacy protection. Confirming and distributing power on decentralized nodes will enable peer-to-peer value exchange to form a new Internet infrastructure in the 5G era.

Focusing on the application scenarios of GMC and the development of derivative products, the GMC team focuses on developing a series of new protocols and methods to help different projects and assets communicate with each other. With the help of the 5G era, on the one hand, the matrix network architecture is used to solve online and offline applications. The complexity of the scene, on the other hand, can sink to the edge nodes through the multi-access edge computing computing power, provide third-party application

integration, and provide unlimited possibilities for mobile edge entry service innovation.

3. Project introduction

The goal of GMC is a completely anonymous 5G application public chain initiated by the 5G Industrial Application Global Alliance, to create a global 5G + blockchain data confirmation application ecosystem, to build a universal, complete support function, high performance, rich application scenarios, and easy Use and user experience a good public chain system and related infrastructure to create a blockchain ecosystem with 5G combined with data confirmation applications. Focus on 5G + blockchain data confirmation applications and platform-level core technologies, build features such as original fully distributed anonymous P2P network communication protocol, original composite transaction group consensus mechanism and mining mechanism, support transaction anonymous protection, Turing complete smart contract . It supports third-party asset issuance, cross-chain communication, multi-chain integration and other functions, and can be landed in the actual application field in the form of public chain, alliance chain, and private chain.

3.1 Concept and Vision

The vision is to use 5G combined with blockchain decentralized technology to realize the commercialized ecological application of a full range of value systems such as data confirmation, cross-border payment, and product traceability. Provide basic network for various value transmission applications. Its ecological platform closely connects the "5G + blockchain data right ecological application" in a new way to form an unprecedented digital world application ecology. The ecological chain and the ecological circle are intertwined with each other to form a matrix structure, which together constitute a complete and open cycle

ecosystem. Relying on the team's profound knowledge and accumulation of the financial industry, as well as the adherence to decentralized beliefs and liberalism, will lead an era of anonymized big data applications with asset security and full freedom.

3.2 GMC global mining machine node

Global miner nodes are servers running on the p2p network, and let small nodes use them to accept dynamic changes from the entire network. These nodes require significant traffic and other resources that consume a lot of costs. From this period of time, it will be observed that the number of these nodes on the Bitcoin network is steadily declining, which requires an additional 40 seconds of block broadcast time. In order to solve this problem, many solutions have been proposed, and the GMC team introduced a new reward program and Bitnodes incentive program researched by Microsoft.

Global nodes: "masternodes" and "miners". Masternodes provide instant sending and private sending functions. Instant sending allows masternodes to reach consensus within one second, resulting in irreversible transactions. "Private sending" uses mixed currency technology to obscure the sender and recipient wallets of a given transaction. Since the network is based on proof of work, there are also mining nodes to calculate the hash value in order to cryptographically protect GMC blocks chain. To continue to develop and market its business, GMC will pay the "block tax". GMC relies on the master node to send anonymous transactions, but this type of transaction is not necessary. Unlike other public chains, addresses and holdings can be seen on the blockchain, and transactions executed without anonymous sending may be audited.

In terms of node transactions, GMC uses mixed currency technology. Mixed currency technology is based on the principle of

grouping transactions together to create joint payments. When making joint payments, it is impossible to link inputs and outputs in a transaction, thereby preventing third parties from determining the direction and amount of the transaction. The CoinJoin-based coin-mixing method increases the privacy of all users, because all inputs to a transaction are no longer possible from a single wallet, so it is no longer possible to reliably associate with a single user. So as to ensure the anonymity and encryption of GMC users' private information. These nodes are very important for the health of the entire GMC ecosystem. They allow clients to synchronize and quickly broadcast information through the entire network. At the same time, the GMC team is also trying to add a secondary network called the GMC master node network. These nodes will have high availability, and will be able to get service rewards from the master node after providing services that meet certain requirements for the network.

The main reason for the sharp decrease in the total nodes of the current digital currency network is the lack of rewards for running nodes. Over time, there will be more users accessing the entire network, the demand for bandwidth will be higher, and the capital requirements for node operators will also be higher, resulting in higher costs for running full nodes. Considering the rising costs, node operators must reduce their operating costs or run light clients, but this is not conducive to the overall ecological health.

Just like the Bitcoin network, the master node is a full node, but the difference is that the master node must provide certain services to the entire network and require a certain amount of deposit to join. The deposit will not be lost and it is safe when the master node is running. This allows investors to earn a certain amount of investment income while providing services for the entire network, reducing the price volatility.

Running a master node requires storing a certain amount of GMC.

When the master node becomes effective, it can provide services for clients on the entire network and obtain rewards in the form of interest. This allows users to invest in this service, but at the same time get a certain return. The revenue obtained by the master node comes from the same mining pool, and about 45% of the block rewards are included in this plan. Considering that the reward rate of the master node reward plan is a fixed percentage and the fact that there are fluctuations in the master node network node, it is expected that the master node reward will change according to the total number of master nodes currently in effect.

4. Introduction of GMC Ecological Application

GMC is a block system built on a P2P network. Similar to the current popular P2P digital currency system, GMC maintains transparent ledgers in a decentralized manner, and realizes independent and secure management and efficient flow of users' digital assets. The GMC system is designed for the needs of 5G + data services, and uses block technology to provide a decentralized security management platform for data services to achieve the high concurrency and low latency performance requirements required by the system.

GMC organizes user transactions (transactions) through security consensus and forms data blocks in chronological order. Unlike Bitcoin and other single-chain systems, GMC uses a tree structure to store and arrange blocks, which can be forked to form multiple branches based on business type and data load. The branches are independent of each other, and the newly added blocks are only related to their own branch data. In the case of multiple branches, according to business data traffic, it can be distributed into multiple branch blocks. The resulting scalability and high concurrency are exactly the basic performance required by the system. The multi-branch structure of GMC consists of a unique security main chain and many application branches. The security main chain is used to support the consensus mechanism of the entire network, and the application branch is used for actual business. The application branch chain can provide a minimum of 2 seconds of low-latency transaction confirmation. Users can specify the urgency of the transaction and pay the corresponding transaction fee to achieve low-latency business.

4.1 GMC Data Confirmation-Liberalized Asset Management

As digital currencies are gradually entering the public eye, digital assets are gradually being accepted by investors. However, due to the relatively geeky blockchain technology, the rapid increase in asset variety, the difficulty in screening investment assets, and the relatively scattered investment channels, the higher barriers for ordinary investors. Professional asset management services will surely be the future trend. GMC will launch GMC, an asset management service platform based on blockchain data confirmation applications, to lower the investment threshold, transaction and management costs of digital assets. At present, the company has completed the development of combined analysis tools and started testing.

GMC hopes to use blockchain technology and tool products to solve many problems exposed by traditional asset management. The GMC team plans to develop, develop, and open source smart contracts for digital asset investment custody, standardize the behavior of investment consultants and investors, realize the security and transparency of entrustment and behavior, establish an asset management platform, and obtain relevant benefits from it. The team plans to complete and launch related functions in 2020.

The team is relatively optimistic about the future development of the product. Traditional asset management service platforms often charge relatively high management fees and performance dividends. Through the decentralized technology of blockchain, only putting the commission specification into smart contracts can reduce management fees and transaction costs.

To use the Internet as an asset management platform, investors and investment consultants must be gathered. To this end, the team will launch digital asset portfolio analysis tools and intelligent trading tools in the early stage. By solving the current pain points of investors, it will

gather some potential investors and screen out some users with higher investment returns as potential future investment advisers.

At present, the team has developed a digital asset portfolio analysis tool. Users only need to fill in the account of each trading platform, and can view their asset value and rate of return on each platform in real time on the platform, and also know the potential risks of investment. In response to the current problem of decentralized trading platforms, the team is also developing intelligent order trading tools, which are planned to be launched in the second half of 2020 to help users complete transactions on various platforms on one platform, thereby increasing the stickiness of platform users.

4.2 GMC cross-chain e-commerce transaction

The implementation of the GMC cross-chain template and e-commerce template does not require VM compilation, so compared with smart contracts and scripts, the template runs very efficiently. At the same time, the GMC transaction runs fast and securely, and there is no vulnerability that can be attacked like a VM, which prevents the tokens on the chain from being stolen or zeroed due to the VM vulnerability. However, for non-smart contracts, the version update process is a bit more troublesome. After the program is released, it needs to be updated to each client synchronously, and a template automatic update module will be added later.

Performance
A template runs efficiently
without VM compilation

Advantages
Fast and safe with the
prevention of VM vulnerabilities

Disadvantages
Unintelligent contracts,
trouble process of version update

4.3 Distributed ledger system

Faced with the current problems in the blockchain ledger, the GMC team is also committed to developing a new ledger system to promote the continuous development of the blockchain industry. At present, the developed GMC ledger is already in the internal testing stage before going online. The GMC ledger is first and foremost a distributed ledger, and the transaction ledger is stored on the respective servers of the system participants. This will make part of the incomplete information game in the market become a complete information game. No party can tamper with the account book at will, and the regulatory agency will be able to audit based on the general ledger. At a more advanced level, it is possible to break through barriers between various financial institutions to make the ledger interoperable, and all financial institutions use the same ledger. This makes the boundary between off-counter market and intra-market trading blurred. Operational data analysis will be more efficient and reliable.

In the GMC ledger, each node does not save a complete copy of the ledger like Bitcoin, and the node can only see transactions related to itself in the network. Specifically, nodes can see the transactions that they are directly involved in, as well as the predecessors that need to

verify these transactions. Thereby ensuring the anonymity and encryption of the transaction.

When a GMC node processes a transaction, it must download and verify all ancestors of the transaction. Therefore, if the transaction process is long, new transactions may need to verify a large number of ancestors, thereby triggering the scalability problem of GMC. In addition, if the transaction contains a high degree of hybridization, the ancestors of the new transaction may include many or most of the past transactions in the network.

In contrast, if the history of the transaction is "shallow" and contains many disconnected transaction chains that do not affect each other, the advantages of GMC are obvious. Nodes never need to verify a large number of transactions at the same time, and can be silent about most transactions that are not related to themselves. If used as a financial ledger, it can be said that GMC is very suitable for a highly fragmented market, and its assets rarely change hands.

The notary mechanism is the core mechanism of GMC network transaction verification and confirmation. This mechanism avoids the broadcast of transaction information on the entire network. This is mainly to support the ability of transaction information to be "moderately visible". Another purpose is to separate the consensus mechanism from the transaction process into a standard service, so that different forms of consensus implementation can be used instead of being tied to a specific algorithm.

The notary has an independent role that both parties to the transaction (multiple parties) trust to confirm the validity of the transaction. The validity of a transaction means that an input data has not been or is becoming an input for other transactions. From this perspective, the notary mechanism is an alternative to Bitcoin's consensus mechanism-blockchain. The GMC ledger is not an open network, but a semi-trusted network. The participation of participants

and nodes can be reviewed in advance, which greatly reduces the probability of attacks. Even if there is a malicious attack, the participants need to pay the cost of reputation and the corresponding legal risk, which is completely different from the completely open anonymous network such as Bitcoin.

4.4 Distributed social network applications

The distributed social network application is based on blockchain technology and distributed P2P technology, and realizes a decentralized, arbitrarily accessible social network world that is not affected by any organization. Unlike social networks that are accessed daily, distributed social networks do not have the concept of a server. All network data is scored on the computers of each user of the distributed social network. Anyone only needs a pair of GMC-based asymmetric keys. Ability to post content.

Everyone can find the publisher's computer on the P2P network through the publisher's private key published by the publisher, and directly download the site's data from it. After more and more users visit, the content of the publisher will be saved by multiple computers. The computer that has visited the user 's social homepage will start to seed the user 's site. Just like the BT seed, the content of the user 's site will be In this way, it will be stored permanently in countless computers. Similarly, due to the P 2P decentralized hosting feature of GMC distributed social network, building a website is also very simple. There is no need to rent a host. All the user needs is to generate a random website address through commands and write its HTML code. And then publish it to others.

4.5 GMC 5G mining machine pool

GMC provides 5G mining machine rental and ordering to

increase users' diversified investment methods. Aside from high-risk currency speculators, it is suitable for long-term value investors who are optimistic about mainstream currencies. The platform will provide global high-performance low-cost mines for escrow and mining. Order miners directly and pay custody fees.

The 5G ecosystem token that holds GMC earns profits through mining with 5G mining machines, and the more you hold GMC, the greater the gain. Through the effective node incentive method of the community, GMC allows more system users to become members of the community node and reach a consensus to promote the rapid development of the entire ecosystem. With the application of various scenarios, the value of GMC has gradually increased.

4.6 GMC Entertainment Application

GMC entertainment live broadcast platform, interactive entertainment, self-entertainment, and GMC rewards. It provides users with real-time live content that is different from previous recordings. The experience of real-time viewing and deep interaction opens a new door for users. The application of 5G technology improves the entertainment experience. At the same time, it is because users can use the "GMC" profit model to establish and carry forward, becoming the fourth Internet profit method after "games, advertising, e-commerce".

4.7 GMC intelligent quantitative trading

GMC's AI intelligent high-frequency trading and brick arbitrage provide users with more value-added channels, professional teams

take care of them, and save worry. GMC can monitor market changes 24 hours a day and conduct high-frequency trading on major exchanges around the world. GMC AI will automatically buy low and sell high according to your settings. Intelligent full-automatic trading APP One-key custody and brick arbitrage, the custody fee must be paid by GMC.

5. Tree block architecture

In today's common blockchain projects, all transaction information is stored in single-chain blocks, making the entire system lack sufficient flexibility in the face of increasing transaction scale. In GMC, the main chain data and application data are divided, and the system block data is stored in a tree block structure of "safe main chain + multiple application branches".

The main security chain mainly stores data related to transactions and security consensus; the application side forks from any chain to generate a branch chain (forked chain), which specifically organizes and stores data related to application business. And as the transaction scale expands, the branch chain can continue to establish sub-level branch chains. This kind of vertical segmentation-like method eliminates the disadvantage of filling all transactions in the main chain block in the traditional single-chain structure, and realizes the horizontal expansion of the overall system.

The greater the number of branches on the GMC, the higher the TPS (Transaction Per Second) that the system can carry. With sufficient branch chains applied, the overall GMC can achieve tens or even billions of TPS bearers.

Brief description of consensus mechanism

As we all know, in various discussions of the "impossible triangle", the results of decentralization often mean inefficient TPS, and the massive data of the Internet of Things has become a huge stone that cannot be removed in the consensus building. In the field of 5G technology, what exactly is suitable consensus? Let's start with the evolution of the consensus algorithm.

Proof of X is a type of consensus that is widely used in the field of public chains. Among them, PoW was first applied, but there were resource waste, concentrated computing power, lack of finality, and poor performance.

PoS is a current strong competitor, which can avoid waste of resources, weaken the needs of the central mining pool, and reduce the possibility of 51% attacks. However, it also has difficulties in determining the number of accounting nodes, there is an unexpected centralization problem, Nothing at Stake .

In order to solve the above drawbacks, many hybrid consensuses have also been born, hoping to combine the advantages of the two and avoid certain disadvantages, including PoW + PoS, DPoS + BFT, etc. Therefore, the hybrid consensus mechanism may be a way out for the later development of the public chain.

PoW consensus algorithm

PoW (Proof of Work) is a proof of work. The digital currency is distributed according to the workload of the miner. The higher the performance of the miner, the more the number, and the greater the workload, the more digital currency will be obtained.

BTC is the most typical prototype using PoW scheme. It includes solving a mathematical problem through the mining process, and miners have completed PoW through this technical means to obtain the accounting right. Because it requires computing power resources, successful mining unions receive BTC as a reward. In order to control the monetary base, mining has been set to a more complicated model. Because the probability of each miner solving a problem depends on his computing power, the difficulty of mining is determined by the sum of all computing power in the system.

For the cryptocurrency of the PoW mechanism, the miners confirm and fix the transfer by solving mathematical problems through

competition. The first miner to solve the problem is rewarded. The complexity of the problem is deliberately created to control the monetary base. This process was regarded as a genius move by some people, and it solved the Byzantine general problem well. But it was criticized by others for its inefficiency because it was a waste of resources. At the same time, the single PoW mechanism also faces security issues such as 51% computing power attacks. With the development of BTC and the development of the blockchain industry, the shortcomings of the PoW mechanism have also been exposed. The currency holders cannot participate in any decision-making, and the right to speak is concentrated in the hands of miners, which is contrary to the decentralized concept, and the decision-making power is concentrated in the hands of a few miners.

DPoS consensus algorithm

DPoS is based on PoW and PoS, a new type of consensus algorithm that guarantees the security of digital currency networks. It can not only solve the problem of excessive energy consumption caused by PoW during the mining process, but also avoid the problem of bias in the "trust balance" that may arise under the PoS rights allocation. Then, DPoS can naturally become a consensus mechanism that stands out in consensus mechanism 3.0. DPoS allows users to participate extensively in mining, which means that each currency holder can vote, thereby generating a certain number of representatives, or understanding a certain number of nodes or mining pools The rights are exactly equal. Currency holders can replace these representatives at any time by voting to maintain the "long-term purity" of the system on the chain.

Network description

The GMC network consists of nodes running GMC software to form a P2P network. The overall network architecture of GMC can be divided into three layers: node network layer, terminal service layer, and 5G terminal layer.

The node network layer is composed of nodes running the GMC core node program. Blocks and transaction data are synchronously verified between nodes and block data is organized by consensus.

The terminal service network forms a distributed terminal background and provides access services for 5G terminals.

In order to support huge 5G services, the node network and the terminal service network together form a GMC service platform.

The 5G terminal layer includes smart sensors, controllers, and mobile terminals, with embedded light client programs, and local private keys to save transaction completion and verification.

System software composition

In order to better support multiple application scenarios in 5G complex environments, and at the same time ensure the reliable operation of blockchain services and the needs of ordinary users. The design of GMC system software generally includes five parts: core wallet program, light wallet background service system, mobile light wallet program, embedded system light wallet SDK and online block browser.

Core wallet program

The core wallet program is used for backbone network nodes and ordinary users. It has certain requirements on the operating environment and hardware, and can fully use all functional modules of the block system.

Light wallet background service system

LWS is the abbreviation of light wallet service, and it is a bridge between GMC's public blockchain backbone network and terminal data collection sensor equipment. Through it, the blocks and transaction data of the GMC core wallet are updated and cached in a timely manner in LWS's own high-speed memory database and local database.

Based on these data, it will calculate the latest UTXO collection of public key addresses corresponding to the keys held by different terminal devices, and publish this information to the Amazon cloud facility through the mqtt connection with AWS's 5G Core. Its message broker forwards to the corresponding terminal device that subscribes to this information. Correspondingly, the terminal device will collect the data collected by the monitoring and monitoring according to these UTXO lists related to itself, package the data into the transaction, and publish it to the 5G Core through mqtt.

Push to the LWS that subscribes to these devices to send transaction topics through the latter's message broker. LWS will verify these transactions. If the verification is successful, it will forward this part of the transaction to the GMC core wallet through the Socket API. The P2P network interface broadcasts these transactions to the entire GMC network, and the block node collects these transactions, and finally completes the operation of its packaged block on-chain.

LWS uses the long-connection, two-way message pub / sub message broker provided by AWS to release the coupling relationship with the massively connected device-side data interaction, which solves the high concurrency and high scalability of the device. For storage queries of block and transaction data and updates of UTXO data, LWS uses the Amazon DynamoDB service of AWS to store their KV key-value data.

Considering the massive transaction data and packaged block data

generated by high concurrent TPS on multiple branches of the GMC public chain network, as well as massive UTXO data, using AWS's ms-level response delay data storage service Amazon DynamoDB can be for each business branch Chain creates a block database and transaction database to speed up data retrieval capabilities.

LWS synchronizes the blockchain data in the backbone network, and uses the high-throughput and elastically scalable Amazon Kinesis service to use Amazon S3 highly scalable (Scalability), high durability (Durability) and high availability (Availability) distributed data The storage service caches a huge amount of block files to the Amazon cloud to complete the real-time data collection and processing of the block, which can be used for other LWS near the local physical address, and even provide retrieval services to LWS worldwide. On the other hand, LWS is When the core wallet is out of step or the data is wrong, you can use the data in S3 to quickly recover. In addition, LWS uses AWS's rules engine to convert and route messages to AWS services, and the backend uses Kinesis services to distribute data to different AWS services, or connects to Lambda services to distribute data. In an environment with uneven transmission of regional networks, you can also use AWS CloudFront service to provide CDN-like functions.

Using the PB-level Amazon Redshift relational data warehouse, you can store structured blockchain data, which is convenient for GMC blockchain web browsers, smart device wallet apps, and GMC blockchain development testers to debug and track the data view of the runtime of the program.

LWS is developed using golang, a highly concurrent language. The program uses goroutine and channel facilities to ensure that a large number of device-side requests to send transactions to the core wallet backbone network can be processed in a timely and effective manner, thereby achieving high-speed on-chain of massive transactions.

Mobile Light Wallet Program

The mobile wallet program can enable terminal nodes to verify transactions without running a complete wallet program. It is mainly used for IOS and Android mobile terminals, and provides users with a secure wallet service when the network bandwidth and hardware performance are relatively limited.

Embedded system light wallet

The embedded system light wallet SDK provides a light wallet API for 5G smart hardware. It can be connected to the GMC network through a terminal server, without the need for heavy block synchronization and block data storage locally, focusing on business-related transaction data construction and identification right.

Online blockchain browser

The online block browser cooperates with the wallet node to display the status of the block system in real time and query historical block transaction data.

Branch ID

The blocks of the GMC system are connected together in chronological order, forming a tree structure with multiple branches. In GMC, the security main chain and application branch chain are collectively called "branch". Each branch will be marked with a unique branch logo. The security main chain uses the hash of the genesis block as the branch chain ID, and the branch chain uses the hash of the first block after the fork as the branch chain ID.

Before the fork, the parent chain and the branch chain have completely the same chain structure and transactions; after the fork point, they are independent of each other and do not interfere with each

other. The same token that appears before the fork point can create different transactions in the parent chain and branch chain after the fork point and send them to different addresses; the block data before the fork point can also be in the parent chain and branch chain Universal. When creating a transaction, the user needs to specify an anchor block, and all branches after the block are valid. If the anchor block is set to Block n-1, the created transaction will be included in the two branch chains; if set to Block n, the transaction is only valid in the parent chain, and new transactions can be created in the branch chain Token sends other addresses.
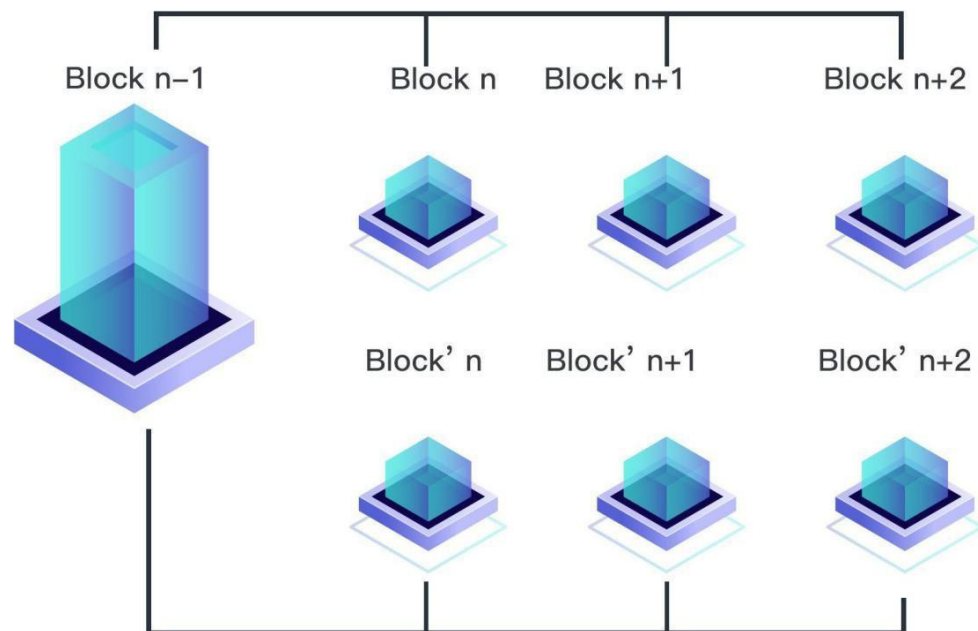
Security Main Chain

The security main chain is the main chain in the GMC tree structure, and all branches are its "descendants". It is used to support the security and consensus of the entire block system. In the P2P network, the synchronous broadcast message of the main chain has priority The level is higher than the application branch chain. In addition to recording the main chain Token transfer, the security main chain also retains key process data for DPoS node negotiation. No sub-blocks can be inserted between the blocks of the security main chain, and can only grow according to the predetermined block interval. Since there will be a

considerable part of the capacity to record the consensus negotiation process data (taking 23 DPoS nodes as an example, the negotiation data will occupy about 115KB per block), so the transaction capacity of the security main chain is lower than that of the application branch chain. The safety main chain starts from the genesis block of the block system and generates blocks through the DPoS + PoW consensus sequence. The security main chain is used to support the security and consensus of the entire block system. All application branch nodes need to synchronize and verify the main chain block header information. After the new node accesses the network, the main chain synchronization is completed first, and then the corresponding application branch synchronization is started.

Main Chain Special Transaction

In the main security chain, in view of the special features of the function, there are three types of transactions related to the consensus mechanism that are unique to the main security chain: DPoS node voting transactions; DPoS node registration transactions; PoW block reward transactions.

DPoS node voting transaction

The DPoS node generates a Delegate template address. For the first time, you need to send a Token to this address to complete the release of the Delegate address chain; users create the Delegate address using the same parameters as the DPoS node, and register the Token at the Delegate address to complete the Token voting. DPoS nodes can use the vote of the Delegate address as a weight to participate in the DPoS negotiation process. When users vote for depositing Delegate addresses, the ownership still belongs to users and can be withdrawn at any time, but once withdrawn, the number of

corresponding nodes' votes will also be reduced accordingly.

DPoS node registration transaction

DPoS nodes need to raise enough tokens to vote in each round of negotiation, and use this to create registration transactions to register on the chain in advance and publish their own initial negotiation parameters. Only nodes that have completed registration before the start of the negotiation round (more than 2% of the total votes) Allow access to the negotiation process and obtain block rights.

PoW block reward transaction

By default, PoW consensus is only used for main chain consensus block generation, and corresponding block generation rewards are provided to participants through such transactions. The role of this type of transaction is similar to the coinbase transaction in Bitcoin.

Application branch

In GMC, the application sends a special type of transaction in the parent chain ----- forked transaction, which is used to create an application branch. The block generation interval of the application branch chain needs to be consistent with the security main chain. Other main parameters can be configured by the creator during the initialization process of the branch creation. Configurable parameters include the total amount and distribution of tokens, block rewards and additional issuance methods.

The first block (branch start block) of the newly created branch is saved in the forked transaction. The Token distribution of the branch chain can be defined by the creator, there are three ways:

˷ Create an independent branch, and reset the total number of tokens and distribution method at the branch start block;

˷ Complete inheritance of the distribution of fork point tokens;

˷Inherit the distribution of fork point tokens and issue additional shares on this basis. The distribution of the additional issues is defined in the branch start block.

Since the branch point, the branch chain Token and the parent chain are completely isolated.

Mortgage mechanism

In order to prevent malicious people from consuming resources from the parent chain through high-frequency bifurcation, the parent chain Token needs to be used for mortgage every time a branch chain is established. The token used for mortgage in the fork transaction is sent to a special address for freezing. Mortgage Tokens are unfrozen in stages according to the difference between the height of the parent chain block and the initial height of the parent chain block. The creator can transfer the unfrozen part of the Token to another address after signing with his own private key. The mortgage token required to create a branch chain decreases with the difference between the height of the block and the initial height, and is halved every 525600 blocks. The base N of the mortgage token is determined by the initial total token supply of the parent chain.

6. User key and address

There are two types of GMC addresses: public key addresses and template addresses, which respectively correspond to specific public keys and templates. The length of the address is fixed at 33 bytes. In the interactive interface, the encoded address is used as the input / output parameter.

```
pubkey address:
encoded address = '1' + BASE32Encode(pubkey + CRC24q(pubkey))
template address:
encoded address = '2' + BASE32Encode(template ID + CRC24q(template ID))
```

Among them, BASE32Encode uses the Crockford scheme character set, but does not carry out the scheme symbols check process.

Key and public key addresses

The GMC system uses curve25519 as the basic security algorithm. The user's private key and public key are both 32 bytes, and the private key signature is 64 bytes. The security of curve25519 is the same as that of P256. The same security algorithm is the most efficient asymmetric security algorithm. Use the type prefix + public key as the wallet public key address.

In order to ensure the security of the user's private key, the chacha20 + poly1305 algorithm is used for encryption in the local storage. The user needs to enter the password to use the private key for signature operation.

Template address

The template address consists of the type prefix + template ID. The

template ID is composed of 2 bytes template type + parameter Hash low 30 bytes. For example, a 3-5 multi-signature template:

```
public keys:
  1: fcd74aa82a1eb098830a2fcc877735a60152b441c16b2212157c4215db074e88
  2: f1a1ced60a7ecdf83735a3380765f2ef77221f367da05bd901e885b9d799aec5
  3: c2885254a2acefaeb05bd94b0e73e483bded994b02ebd0bc6b3523c2dde558dd
  4: e2de897ad0935bbfd6cca48da2ee285c87ae784285df35513180143ec55c8450
  5: b1f1ce918f30b46aa3d2648810f6153410e44122c042998699323b982664a16f
tempate ID:
000244c03d536e6175912b3040aa876388b197c21ae55c283f182403ab610852
encoded address:
2a8463ar34gc3ya2wwmdc55xhh1hrfaj060ns2xb1ds9kvg240803k041
```

Template with parameters

Blockchain systems that are popular nowadays can provide scripts or smart contracts that run on different VMs (Virtual Machines), which can provide powerful and flexible functional expansion of the basic ledger of the block system. But as of now, the VM module in the block system is still in its infancy, in addition to the inherent security vulnerabilities and other problems, the operating efficiency and usage rate also limit the scope of application of smart contracts to a certain extent. The GMC system does not provide scripts and smart contract systems, but uses parameterized process templates to implement commonly used scripts and smart contract functions. Use the corresponding template address to provide users with function calls.

7.Blocks and transactions

Block

The data structure of the GMC block is designed as follows:

Elem	Type
nVersion	uint16
nType	uint16
nTimeStamp	uint32
hashPrev	uint256
hashMerkle	uint256
vchProof	vector<uint8>
txMint	CTransaction
vtx	vector < CTransaction >
vchSig	vector<uint8>

Description:

· The current block version is 0x0001.

· The timestamp adopts UTC in seconds.

vchProof includes serialized data of proof of legitimacy. In the main security chain, it includes the calculation results broadcast by DPoS nodes (including the signatures of each node), and PoW blocks also include proof of work parameters; Main chain block hash and consensus calculation results.

txMint does not sign, and the signature field is empty.

The block signature vchSig uses the txMint output address for signature. The signature data segment contains all fields except vchSig.

transaction

GMC uses the UTXO model to record transactions, including the

following data:

Elem	Type
nVersion	uint16
nType	uint16
nLockUntil	uint32
hashAnchor	uint256
vInput	vector<CTxIn>
addrTo	CDestination
nAmount	int64
nTxFee	int64
vchData	vector<uint8>
vchSig	vector<uint8>

Description:

❖ ⸻ The current transaction version is 0x0001.

❖ ⸻HashAnchor is used to indicate the current transaction starting valid

block and corresponding branch.

❖ ⸻ The preceding transactions in the input list require the same output

address.

❖ ⸻The transaction includes two outputs, one is listed in the table

(addrTo / nAmount), and the other is the implicit change output, the

address is the same as the input address, and the amount is (Total

Input-nAmount- nTxFee).

❖ ⸻ Transaction signature is unified address with input list, signature

data segment contains all fields except vchSig.

GMC cross-branch transaction

Cross-branch transactions can be used to achieve synchronized value exchange between GMC branches without trust. In practical applications, business can often be divided according to business processes, equipment types, spatial regions and other related factors, and dispersed into multiple branches. Frequently interacting devices usually hold the same branch Token and conduct data transactions in the same branch. But as a business as a whole, the need to interact with other branch Token devices also exists objectively. In this case, cross-branch transactions can achieve Token exchange between branches. On the one hand, cross-branch transactions can be completed without trust, using technical principles to ensure fairness to both parties; on the other hand, cross-branch transactions enter blocks synchronously between the two branches, ensuring high efficiency and effectiveness. This provides a good underlying technical support for applications including decentralized exchanges and token exchange gateways.

8. GMC Team

CEO, Peter: Philip Patrick, co-founder of PCA Blockchain Lab and a senior investor in blockchain. Studying as a graduate student at the School of Computer Science, Oxford University, United Kingdom. He has 6 years of experience in the blockchain industry. He has led several teams in the blockchain industry and served as a consultant for multiple blockchain projects. He is the first to participate in the management of the TWITTE technical program group in the United States. He has unique insights into the future direction of blockchain technology and has made unique contributions to the development of blockchain in the field of value.

Chief Operating Officer, Job: Graduated from Durham University Business School, has 6 years of operation and management experience in the financial and wealth industry, has deep research on the application development of blockchain projects, and was the operation director of Ask. He once served as the general manager of the FST Group and the Swedish branch, responsible

for coordinating and managing all the company's affairs. Created the first consecutive year of performance in Europe.

Chief Financial Officer, Alina: Graduated from Stanford University Business School. He worked in the HSBC Investment Banking Department in London and participated in a number of investment and financing projects and financing transactions. He used to be the financial director of investment banks and asset management companies in the African region of the Morgan Consortium. He has extensive experience in asset management and risk control management in the blockchain field. So far, he has 7 years of senior management work experience, has deep connections in the industry, and has deep knowledge of financial management and enterprise risk management.


Chief Marketing Officer, William: William Theodore, professional investment manager in the technical and banking background of Global Investment and Credit Suisse, and later served as the Director of Risk Control for the Americas of Kohler Capital. He has established sufficient trust and influence

in investment institutions, venture capital funds and investors. Is a famous professional investor. In 2013, we focused on the blockchain industry and invested in multiple blockchain projects, especially the development of public blockchain projects with underlying blockchain technology. Now he is one of GMC's main investors.

Chief Technology Officer, Works: Vaux, graduated from Yale University with a major in computer science. As a top IT engineer, he once served as the technical director of Australia in Microsoft. Later, he has served many blockchain teams and has excellent code and architecture technology. He has participated in the planning of multiple blockchain projects and has extensive experience in blockchain development.
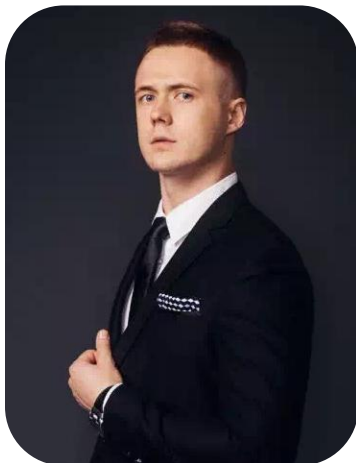
Chief Strategic Advisor, Woodrow Dean: Dean Woodrow, a UK multinational investment company in various industries including IT / media, real estate, M & A FinTech and BF investment, has extensive experience in international

taxation and law. He is the lead lawyer on the board of several companies. Now serves as the head of GMC's legal team.

9. GMC Token distribution mechanism

In order to promote the development of GMC ecology from the incentive level, GMC constantly issues 80 million tokens, which is based on the decentralized digital assets issued by Ethereum, and the token is referred to as GMC.

Token issuer: GMC Foundation.

The distribution ratio of GMC tokens is as follows:

Token Distribution Map

- Project marketing 10%
- Cooperation agencies 25%
- Global community 20%
- Foundation 10%
- Development team 5%
- R&D 15%
- Angel Wheel available 15%

10. Disclaimer and risk statement

Disclaimer

Except as expressly stated in this white paper, the GMC developers do not make any representations or guarantees on GMC (especially its marketability and specific functions). Anyone participating in the GMC project is based on their own knowledge of GMC and the information in this white paper. The GMC developer hereby expressly disclaims and refuses to bear the following responsibilities:

1. Anyone who violates the anti-money laundering, anti-terrorist financing or other regulatory requirements of any country when participating in the GMC project;

2. Anyone who violates the requirements or obligations imposed by this white paper when participating in the GMC project, and the resulting inability to pay or cannot withdraw GMC coins;

3. The development of GMC fails or is abandoned, and the resulting failure to deliver GMC coins;

4. The postponement or postponement of the development of GMC, and the resulting schedule that cannot be disclosed in advance;

5. Errors, defects, defects or other problems in the GMC source code;

6. GMC or GMC coins fail to achieve any specific function or are not suitable for any specific purpose;

7. Failure to disclose information about GMC development in a timely and complete manner;

8. Any participant has leaked, lost or damaged the private key of the digital cryptocurrency or token wallet (especially the private key of the GMC coin wallet used by it);

9. Default, violation, infringement, collapse, paralysis, termination or suspension of services, fraud, misuse, misconduct, misconduct, negligence, bankruptcy, liquidation, dissolution or closure of GMC coin third-party crowdfunding platforms

10. There are differences, conflicts or contradictions between the content of the agreement between anyone and the third-party crowdfunding platform and the content of this white paper;

11. Anyone's trading or speculation on GMC;

12. The listing or delisting of GMC coins on any exchange;

13. GMC currency is classified or regarded as a currency, securities, commercial paper, negotiable paper, investment goods or other things by any government, quasi-government agency, competent authority or public agency, so that it is prohibited, regulated or legal limit;

Fund security and management

The funds received by the project shall be kept and operated in accordance with the principles of transparency, auditability and efficiency. The profits of the platform are kept by multi-signature wallets and are reviewed by the public. For security issues, the private keys of these multi-signature wallets are controlled by five trusted individuals. The wallet requires any five people to sign at the same time to perform any payment. The funds received by the platform will not be used for GMC developer shareholder dividends or profit distribution. It will all be used for technical work such as the development and maintenance of GMC and the construction of GMC's ecosystem (such as investment in the cultivation of various applications on GMC, etc.).

Risk disclosure

There are risks in the development, maintenance and operation of GMC, many of which are beyond the control of the developer. In addition to the other contents described in this white paper, each participant of GMC should read, understand and carefully consider the following risks before deciding whether to participate in this platform project.

Participation in this platform project should be a well-thought-out decision-making action, and it will be considered that the participants have fully known

and agreed to accept the following risks:

1. The risk that GMC cannot be developed or used normally due to changes in legal policies or government actions, or that GMC coins are prohibited from being held or used;

2. Due to the development of cryptography or the commercialization of quantum computers, the currency based on cryptography no longer has the risk of sufficient security (such as the private key is easily broken);

3. The risk of development failure due to the difficulty of GMC technology development;

4. The risk of the theft of ETH or BTC obtained by the project of this platform, resulting in the lack of financial support for GMC development and unsustainable risks;

5. The source code of GMC has the risk of various faults in the operation process of GMC caused by defects, defects and vulnerabilities;

6. The source code of GMC is upgraded or modified based on community requirements, which leads to unpredictable risks;

7. The risk of GMC being attacked by "distributed denial of service" or other types of attacks during operation;

8. Risk of theft, forgetting or loss of GMC coins held by anyone;

9. GMC coins lack the secondary trading market, the price is unstable or there is no risk that others are willing to buy GMC coins;

10. The development and operation of other blockchains with similar functions or competitive relationships with GMC, so that the risk of GMC being marginalized or excluded from the market;

11. Risks caused by faults and defects of various applications on GMC developed by third parties.