TORO

TORO

NETWORK WHITE PAPER

SHARING OF IDLE RESOURCES

Content

Subtract

TORO is a distributed CDN system based on the basic public chain of data sharing. Aiming at the common pain points of transaction congestion and high transaction cost in the existing blockchain, TORO aims at "speed, win-win and convenience", builds the largest decentralized sharing economy and business application ecology in the world, supports massive concurrent transactions with DAG technology and faster transaction confirmation, and promotes the growth of sharing economy State landing becomes reality.

The system integrates CDN mining, intelligent contract settlement and CDN trading market. TORO calls on global network participants to share their idle devices (such as mobile phones, routers, etc.) and provide upload traffic by working off the chain and settling accounts on the chain, so as to make Internet acceleration nodes everywhere.

TORO's smart contract system based on Ethereum enables users with idle bandwidth to share idle Internet devices and upload traffic without additional investment, and also enables website owners who need to accelerate to obtain distributed CDN services with lower price, more nodes and faster speed.

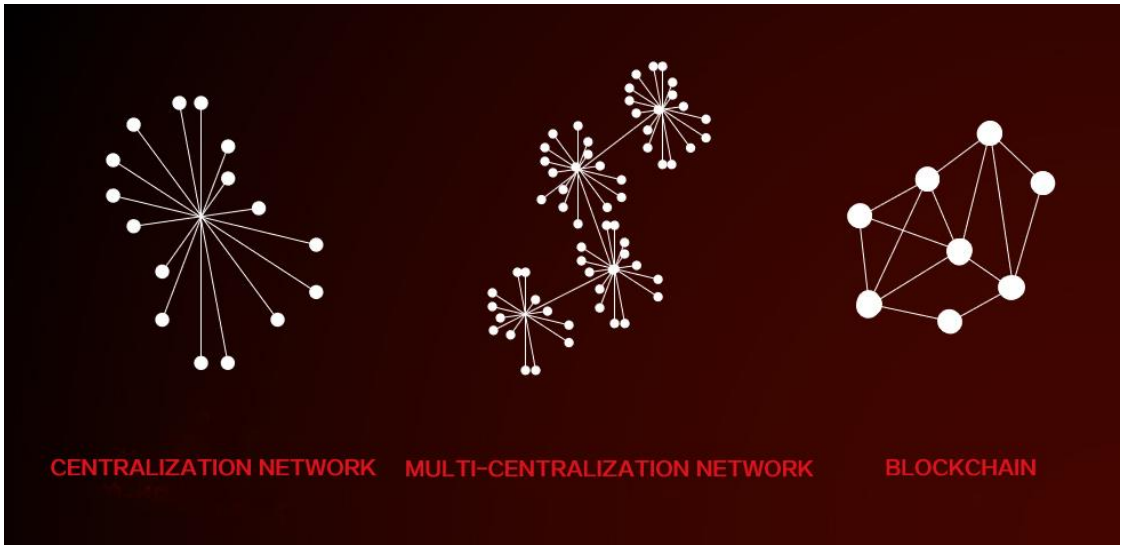
TORO has reached strategic cooperation with many communication service providers around the world, and has developed mobile mining terminals with incentive mechanism. It is the first traffic entry for TORO to expand its landing ecology. Its deployment can greatly improve the utilization rate of home network resources, and solve the problem of storage space waste through distributed technology. In addition, the mobile mining terminal is also the mining equipment of each node of the TORO main network.

TORO cloud is a TORO ecological cloud network, which has the characteristics of low cost, globalization, long-lasting storage and high stability. TORO is committed to continuously expanding its application ecology, enabling more and more intelligent terminal devices in the world to adopt the TORO cloud network, enabling the TORO cloud network to connect a wide range of intelligent devices, integrating the computing power, storage space and network transmission functions of many devices, constructing the main functions of point-to-point direct connection transmission, distributed storage mechanism and content addressing, and creating a decentralized transmission value Sharing economic ecological network.

Chapter 1 - Prominent pain points of blockchain mining industry and the emergence of TORO

1.1 Blockchain: New engine of the fourth industrial revolution

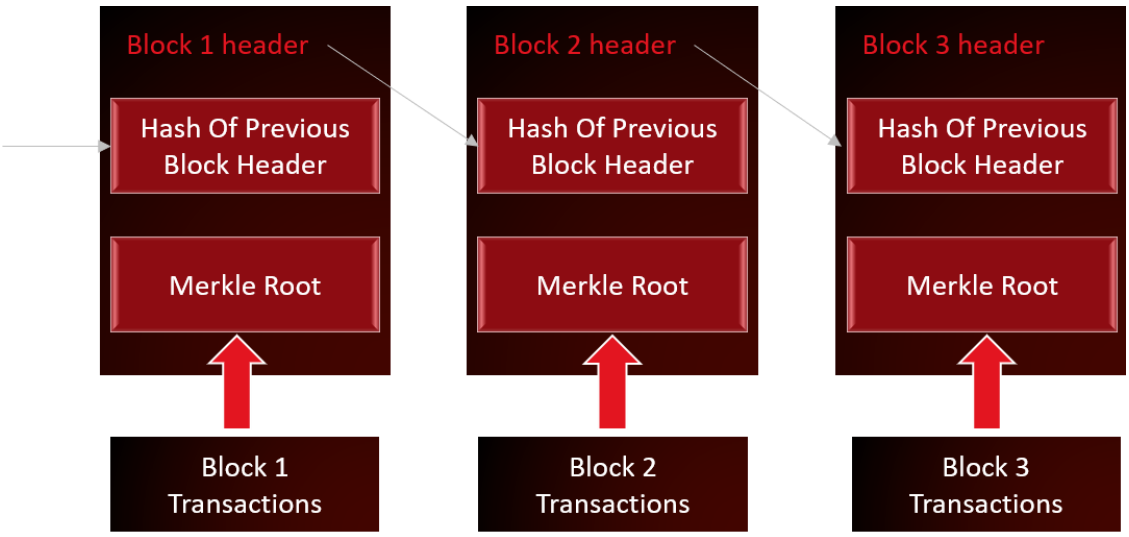
In 2008, Nakamoto published a paper entitled "bitcoin: a peer to peer electronic cash system" in the bitcoin forum, first proposed the concept of blockchain, and built the technical basis of transaction information encryption and transmission and bitcoin network. Since then, crypto currency has become the first application scenario of blockchain technology, developing rapidly.



Because blockchain solves the problem of value dissemination and decentralization, it is considered to be the most disruptive technological innovation since the invention of the Internet, and also known as the next

generation of "value Internet". More and more enterprises are familiar with the powerful energy contained in blockchain technology and actively carry out industrial layout. Business application scenarios also touch more and more industries and fields.

The foundation of value interaction is the establishment of mutual trust. The revolution of blockchain technology is that it realizes a new way of trust. Through the design innovation at the technical level, the trust relationship between people can be transformed into the trust between people and technology in the process of value interaction, and even some links can be executed by program automation, so that the financial activities can be realized at a lower cost.



The point-to-point value transmission of blockchain has subverted people's understanding of the Internet, and the application of blockchain has also been extended to various fields of economy and society. The

most suitable fields are financial fields (payment, transaction, settlement, trade finance, crypto currency, equity, private placement, bonds, financial derivatives, crowdfunding, credit, risk control, credit reference). In the future, the application of blockchain will be in-depth To all aspects of society. Industry insiders predict that blockchain, big data, mobile Internet, cloud computing and other new technologies will set off the fourth industrial revolution in human history.

In the near future, as the scale of industrial Internet connection becomes larger, end-to-end connections and transactions will be more frequent. It is necessary to link the data between the upstream and downstream of the industrial chain through the blockchain, which will help to realize the sharing within the core enterprise ecology, the mutual trust between the industrial enterprises, and the value sharing between the industrial Internet platforms. The blockchain technology will be used to promote the "networked production" of industry The challenges of production collaboration, industrial safety, information sharing, resource integration, and flexible supervision provide corresponding solutions.

The addition of blockchain technology will make the interconnected world more orderly and efficient. However, the application scope of alliance chain or public chain based on license is increasingly wide, the

digital ability of assets continues to improve, and the terminal connection ability driven by 5G becomes stronger and stronger, which will further promote the rapid implementation of blockchain technology. In the long run, the concept and technology of blockchain will further integrate with 5g, industrial Internet, crypto currency, digital identity and other new digital economic infrastructure, and become a "common technology" to promote the development of digital economy.

On the one hand, blockchain is the key technology that can truly meet the needs of the development of the digital economy. The new infrastructure based on blockchain will realize the intelligent operation through the digital twin access for data confirmation, trusted sharing transaction to promote the balance of supply and demand, reduce the marginal cost, realize the value link, flexible and elastic generation and supply model through the flow of data and the exchange of machines Type.

On the other hand, blockchain has the common technology to promote industrial economic value. Through the distributed trust management ability, blockchain technology enables technology, industry, mode and industry, application service ability of convenient access to the Internet, identity recognition ability of unified identity, 5g wide coverage communication and connection ability, and "intelligent +" knowledge

promotion ability matching on demand coupling.

The new infrastructure based on blockchain is the development trend, and it can enable other new infrastructure such as domain name, logo, legal currency, power, 5g, and jointly promote the development of digital economy and the construction of network power. With the support of blockchain infrastructure, a new space of digital economy with multi governance, fairness, credibility and intelligent operation will be established in the future.

At the same time, more and more enterprises are familiar with the powerful energy contained in blockchain technology and actively carry out industrial layout. Business application scenarios also touch more and more industries and fields.

1.2 blockchain: a new direction of global wealth in the future

All types of cryptocurrencies use a distributed ledger technology called blockchain. The blockchain acts as a decentralized system for recording transactions involving specific digital currencies. In short, blockchain is a transaction ledger that maintains the same copy on each member computer in the network. Either party can view previous entries and

record new ones. Most blockchain networks have complex rules for adding a new record group ("block") to the previous record chain, and the block and its contents are protected by powerful encryption technology to ensure that transactions are not forged or destroyed.

In this way, blockchain technology allows digital currencies to maintain a trusted trading network without relying on central authorization. Therefore, crypto currency is considered to be "decentralized". While blockchain is known for its role in promoting the rise of digital currencies over the past few years, the technology has many other non cryptocurrency uses. In terms of its overall impact, the technology itself may far exceed cryptocurrency itself, and the real potential of blockchain has just been discovered. So, whether it's linking to a specific cryptocurrency or using it in many other applications, many other people in the financial advisor and investment community are likely to encounter more blockchain technologies in the next few years.

The value-added space of blockchain and crypto currency is huge, which is a new economic growth point in the digital era. At present, the global derivatives market is worth 532 trillion US dollars, the global debt market is about 247 trillion US dollars, the global securities (stocks) are about 77.7 trillion US dollars, the real estate market is about 217 trillion US

dollars, and the global currency (M2) is about 95.7 trillion US dollars. Since the beginning of 2017, all kinds of tokens have continued to heat up. Taking the representative of pure blockchain asset trading platform, token security, for example, registered users have reached 4 million scale, and the daily trading volume has reached 10 billion US dollars (refer to the data of coinmarketcap.com on January 4, 2018). Even if calculated by 0.1% of the unilateral transaction fee, the daily average income can reach 20 million US dollars. And the market is expanding rapidly.

According to the data statistics of coinmarketcap, the total market value of blockchain assets in the world has exceeded 700 billion US dollars at present, and the scale of single day transactions has exceeded 60 billion US dollars, among which the proportion of bitcoin transactions has decreased from 90% to 33%. Compared with the global foreign exchange market with a single day transaction scale of more than 500 billion US dollars, the blockchain asset market still has a large development space. In addition, according to incomplete statistics, the global ownership of blockchain assets is about 20 million, which will have a huge development space compared with more than 1 billion stock users. People in the industry generally believe that there is at least 100 times more room for the digital money market, and there are two reasons why it is so optimistic. One is the huge prospect of blockchain digital economy

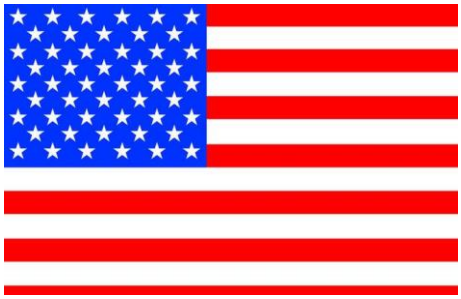
explosion. Second, there are various problems in the traditional business, and the growth momentum has reached the ceiling. For example, as China's fuel vehicles are all transformed into electric vehicles, the demand for oil will sharply decrease, with little room for value-added; real estate has reached a bottleneck period of development; the debt market, due to the global economic downturn, many banks have negative interest rates.

The reason why blockchain can transform the world is that it has huge energy, which is embodied in four value support points: first, technological innovation; second, financial reform; third, digital transformation; fourth, community sharing.

In the future, blockchain will be combined with quantum computing, 5g, big data and artificial intelligence to build an infrastructure of "digital society / digital era" wealth.

1.3 global countries promote the development of blockchain Technology

1.3.1 USA



At the end of 2014, the Federal Reserve issued a white paper on improving the payment system, mentioning the study of a crypto currency. In the white paper, the Federal Reserve pointed out that bitcoin technology is not mature enough at present, but it is interested in further exploring the market. Like bitcoin, the crypto currency will take advantage of the distributed architecture of the Internet to reduce the cost of direct communication. But unlike bitcoin, the Fed will target financial institutions rather than individual users (and the Fed uses the term "point-to-point" rather than "peer-to-peer"). In addition, bitcoin relies on blockchain technology, but the Fed's projects rely on a central general ledger system and central authorities.

In December 2015, NASDAQ, one of the world's largest stock exchanges, first used blockchain technology to complete and record private securities

transactions, which is a great progress in the application field of blockchain technology. The U.S. Securities and Exchange Commission (SEC) has officially approved the online securities issuer overstock's Internet securities issuance plan based on block chain technology. At present, dozens of financial institutions including Nasdaq, NYSE and Citibank are carrying out "blockchain" financial innovation.

On November 16, 2018, the U.S. sec issued the statement on the issuance and trading of crypto asset securities, which clarified the SEC's regulatory requirements on (1) the issuance and sale of crypto asset securities; (2) the investment consultation on crypto asset securities and crypto asset securities; (3) the trading and circulation of crypto asset securities. At the same time, it emphasizes the attitude of SEC towards crypto assets and blockchain Technology: support technological innovation that is conducive to the development of investors and capital markets, but must abide by the federal legal framework, carry out orderly under the premise of regulatory compliance, and encourage entrepreneurs of blockchain emerging technology to hire legal advisers, and seek the assistance of sec when necessary.

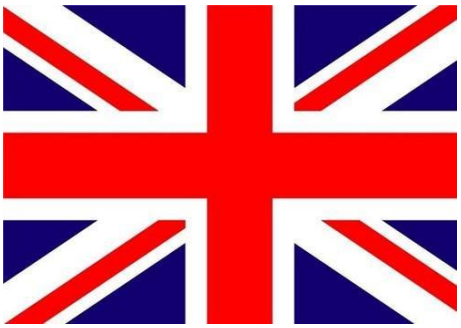
1.3.2 Germany

On March 1, 2016, the federal financial regulatory agency of Germany released an internal report entitled "distributed ledger: technology behind virtual currency - blockchain as an example", which discussed the potential applications of distributed ledger in cross-border payment, inter-bank transfer and transaction data storage. According to the report, the impact of increasing or even fully deploying DLT on the financial industry is still uncertain. However, the German federal financial supervision agency also reminded that attention should be paid to the possible risks in the application of blockchain technology, and continued to call on other regulators around the world to regulate blockchain more strictly.

On September 18, 2019, Angela Merkel's cabinet, the German Chancellor, approved the strategy and determined the government's priority responsibilities in the area of blockchain, including digital identity, securities and corporate finance. At the same time, the strategic document also points out that Germany will not tolerate the threat of stable currencies such as Facebook Libra to its legal currency. In fact, since the

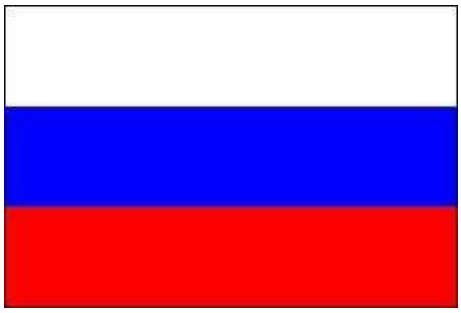
spring of 2019, Germany has begun to discuss blockchain technology through extensive consultation. A total of 158 experts and enterprise representatives participated in the discussion. They submitted 6261 suggestions and responses, in which they proposed to embrace open source software and recognized the government as the final arbiter of technology competition.

1.3.3 UK



On January 19, 2016, the UK government released an important report on blockchain technology. The report, distributed ledger Technology: beyond blockchain, mentioned that the UK federal government is exploring distributed ledger technology similar to blockchain technology and analyzing the potential of blockchain application in traditional financial industry. Not only in the financial sector, the Bank of England pointed out in the above report that decentralized ledger technology has great potential in changing public and private services. It redefines data sharing, transparency and trust between governments and citizens. In addition to creating a public platform based on blockchain to provide services for the whole people and society, the UK government also plans to develop an application system that can be used between the government and public institutions. Mark walport, the government's chief scientist, and his team are working together to explore the integration of distributed ledger technology into government management to ensure the privacy and security of the government.

1.3.4 Russia



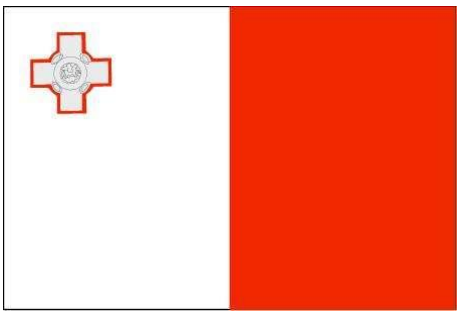
In the last Internet wave, Russia was left behind by the United States and missed the wave of the times. In the development of the new generation of blockchain technology, Russia is obviously unwilling to be a follower and an outgoing player.

At the end of 2015, Russian Internet Development Research Institute submitted a report containing the road map of blockchain technology development to President Vladimir Putin, planning the future legal framework of the technology development. At the international standards organization (ISO) meeting held in 2018, representatives of 25 countries, including China, the United States, Russia and Japan, gathered in Tokyo to set up international standards for blockchain technology. Grigory Marshall Ko, head of the Russian delegation affiliated to the Russian intelligence agency, said ambitiously that "the Internet belongs to the United States, and the blockchain will be Russia's world". In August of the same year, Russian President Vladimir Putin approved the policy of establishing "special economic zone" in primorski Krai region,

oktyabrsky island and Russky Island, and proposed to develop these areas into Russia's "digital development center" in September. In 2019, Russia promulgated the "regulatory act on the implementation of technology application management in decentralized registration and legal certificates" to clarify the supervision of blockchain technology.

Putin once said that anyone who is "late" in blockchain technology development and implementation will be subject to others. Russia should use blockchain technology to build its own digital platform. Russia, which has the most active blockchain project in the world, has obviously started to realize the importance of the blockchain technology revolution for the "fighting nation" Russia from the official level.

1.3.5 Malta



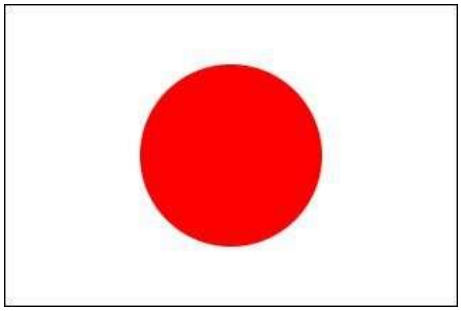
As early as 2013, when bitcoin was not popular, exante, a Maltese financial company, launched the world's first bitcoin hedge fund. Exante also became one of the three largest bitcoin issuers in the world. Then it installed a bitcoin ATM in the town of srima. In November 2016, the

Malta Stock Exchange (MSE) announced the establishment of the blockchain committee to develop a blockchain technology strategy. In December 2017, the "blockchain and crypto currency" conference hosted by the Maltese Government attracted entrepreneurs, investors, consultants and it technicians from around the world to discuss the development and legalization of blockchain technology. In March 2018, the Exchange announced the relocation of its headquarters to Malta. Following the successful landing of Duane in Malta, sun Yuchen, founder of TRX, said that he strongly supported the vision of Joseph Muscat, Prime Minister of Malta, and hoped to build a blockchain island with the Maltese Government. Okex then announced that it would move the company's address from Belize to Malta and set up an office there.

On July 4 of the same year, the Maltese parliament passed three bills, which formally incorporated the regulatory framework of blockchain technology into the law. The three bills include the Malta digital innovation Authority Act (mdia act), which aims to lay the foundation of the Malta Digital Innovation Agency (mdia), and its work mainly focuses on the innovation technology organization plan. Innovation technology arrangements and Services Act (TAS act), which will pave the way for platform operators based on blockchain technology to pass government certification. The virtual financial assets Act (VC act) establishes a

regulatory system for ICO and crypto currency related services, including crypto currency exchanges, wallet providers, crypto asset managers and investment advisers. The promulgation of this series of policies and laws makes Malta an ideal paradise for global crypto currency and blockchain technology investors, and also creates the preconditions for the entry of crypto currency exchange.

1.3.6 Japan



Among Asian countries, Japan's attitude towards blockchain is quite liberal, but it is cautious in supervision. The Japanese government encouraged development in the early stage, and then prudently supervised, and its attitude towards crypto currency and blockchain is also changing to compliance. At present, the Bank of Japan says that it mainly focuses on crypto assets in terms of supervision, and is trying some blockchain projects.

In October 2015, Japan's Ministry of economy and industry held a special

meeting to study the future development and impact of blockchain technology. In order to strengthen all legal currency and digital financial markets, the Japanese government announced an agreement with IBM through the exchange group to try to use blockchain technology in low-level trading markets. In order to improve the security and effectiveness of the crypto currency exchange, the Japanese government established the first blockchain industry organization - Japan blockchain Association (JBA) and blockchain cooperation alliance. This newly established organization is composed of many famous enterprises, who are very concerned about the development, research and implementation of blockchain technology in Japan. The goal of blockchain collaboration group is to increase the research and application of blockchain technology in Japan. In 2017, Japan implemented the payment service act, which officially recognized bitcoin as a legal payment method, and put forward clear regulatory requirements for the crypto asset exchange. In the same year, Japan's new version of consumption tax came into effect, and bitcoin transactions no longer need to pay 8% consumption tax. In 2018, Japan's financial services agency (FSA) pointed out that it will strictly review and monitor the registration of virtual currency. In the same year, the FSA said it would impose a limit on the investment ceiling of ICO after the amendment of the regulation on token issuance. In 2019, Japan's jcba issued "suggestions on new regulation of ICO". In the same year, the

measures for virtual currency exchange and trading rules were strengthened through the amendment of the capital settlement law and the gold commercial law.

Japan's economic volume is huge, and the development foundation of blockchain and financial field is extremely strong. On the one hand, the "Mentougou" incident before Japan has also made Japan very cautious in this field for many years. On the other hand, the Japanese government actively legislates and tolerates bitcoin as a means of payment. The huge market has also attracted many domestic and foreign trading institutions to explore the market.

1.3.7 Singapore

On November 13, 2015, Singapore's prime minister called on the country's banks and regulators to pay close attention to the development of blockchain and other latest technologies, constantly improve their own technology, innovate business models and improve service levels. As a result, Singapore is far more open to blockchain financial innovation regulatory policies than other Asian countries.

In September 2018, the monetary authority of Singapore (MAS) divided tokens into application tokens, payment tokens and securities Tokens: 1) MAS does not intend to regulate application tokens; 2) the internal revenue service agency of Singapore (IRAS) issued a draft in July 2019 to exempt service tax and value-added tax on payment token transactions; 3) securities tokens are applicable to the existing Singapore securities and Futures Law , bitcoin sales and deliveries are subject to tax.

On January 14, 2019, Singapore's parliament deliberated and passed the payment service act, which clearly regulated the crypto currency business.

According to the act, the crypto currency exchange, OTC platform, wallet, etc. belong to the payment type token service providers, which need to meet the relevant anti money laundering regulations and apply for corresponding licenses.

Generally speaking, in recent years, the openness of Singapore's blockchain regulatory policy has gradually increased. Singapore not only reduces the market access threshold of encryption assets, but also actively manages the encryption assets that do not meet the regulatory requirements.

1.3.8 Korea

South Korea is an important part of the global blockchain community, and virtual currency is very popular in South Korea in recent years, reaching its peak in 2017. As a country with a hot token trading market, South Korea has the trend of strengthening supervision in recent years.

On February 3, 2016, the Central Bank of Korea released the Research

Report "the current situation and Enlightenment of distributed ledger technology and crypto currency". KRX, South Korea's only stock exchange, will create an OTC platform using blockchain technology, making it the latest company to explore blockchain technology to promote securities trading. In August 2017, South Korea believed that the transaction of encrypted assets was legal and was "a trading tool or electronic hedging product" protected by law, rather than legal currency. The new financial innovation authority of the Financial Services Commission of South Korea (FSC) will focus on policy development for the country's blockchain and financial technology industries. In 2017, South Korea declared the first token issue (ICO) illegal. However, in May 2018, the legislature of the South Korean government further lifted the ban and formally proposed to allow ICO as long as investor protection measures are in place. In July 2018, the Bank of Korea (Bok) said that encrypted assets are likely to be used as a means of payment in limited areas such as overseas remittance.

More importantly, in 2018, the Korean government announced a tax on the virtual currency exchange, with a tax rate of 24.2%. All virtual currency trading platforms in South Korea need to pay 22% corporate tax and 2.2% local income tax. After that, the South Korean government first announced that it would take 15 technology-based enterprises in 11 fields

including blockchain as tax relief targets in the first quarter of 2019, and then announced tax relief policies ten days later: 30% - 40% tax relief for small and medium-sized enterprises, 20% - 30% tax relief for large enterprises. With the support of tax relief policies, Korean enterprises have entered the blockchain industry and established blockchain R & D teams or studios. At present, the blockchain applications that have been or are close to landing in South Korea involve securities, payment, social networking, games, tourism, medical and other fields.

1.3.9 Hong Kong

Crypto currency assets are regarded as virtual assets by the Hong Kong SAR government, and depending on their exact characteristics, some crypto assets can be regulated as shares, collective investment plans, stored value payment instruments or other instruments.

On December 11, 2017, the circular to licensed corporations and registered institutions: bitcoin futures contracts and investment products related to crypto currency issued by the Hong Kong Securities and

Exchange Commission (SFC) pointed out that the provision of bitcoin futures trading services and other related services by Hong Kong investors constitutes regulatory conditions, and it is necessary to apply for a license from SFC. On November 1, 2018, Hong Kong SFC issued the statement on the regulatory framework for managers, fund distributors and trading platform operators of virtual asset portfolios, and issued new regulations for investment in virtual assets such as encryption assets. The encrypted assets exchange has become a financial technology project allowed by Hong Kong to carry out the "sandbox" experiment, and can issue a formal license after the feasibility is verified.

On March 28, 2019, the Hong Kong SFC issued the statement on the issuance of securities tokens, which stated that securities tokens may belong to the "securities" under the securities and Futures Ordinance and should be regulated, and the promotion and distribution of securities tokens should apply for class 1 License (securities trading), and securities tokens should only be sold to professional investors. On October 4, 2019, the SFC of Hong Kong officially issued regulations on the supervision of crypto asset fund managers, which are basically consistent with the requirements of class 9 license (asset management), but additional requirements are made in the custodial part for the characteristics of crypto assets.

1.3.10 China

At present, major countries in the world are accelerating the development of blockchain technology. China has a good foundation in the field of blockchain. We need to accelerate the development of blockchain technology and industrial innovation, and actively promote the development of blockchain and economic and social integration. On October 24, 2019, the Political Bureau of the CPC Central Committee conducted the 18th collective learning on the current situation and trend of blockchain technology development. Xi Jinping, general secretary of the CPC Central Committee, stressed that the integrated application of block chain technology played an important role in new technological innovation and industrial transformation. We should take blockchain as an important breakthrough in independent innovation of core technology, clarify the main direction of attack, increase investment, focus on tackling a number of key core technologies, and accelerate the development of blockchain technology and industrial innovation.

Xi Jinping emphasized that we should strengthen basic research and

enhance original innovation ability, and strive to make our country take the forefront of theory in the emerging field of block chain, occupy the commanding heights of innovation and gain new industrial advantages. We need to promote collaborative research, accelerate core technology breakthroughs, and provide safe and controllable technical support for the development of blockchain applications. We need to strengthen the research on the standardization of blockchain and enhance the international discourse power and rule-making power. We should accelerate industrial development, give full play to market advantages, and further open up the innovation chain, application chain and value chain. We need to build a blockchain industry ecosystem, accelerate the in-depth integration of blockchain, artificial intelligence, big data, Internet of things and other cutting-edge information technologies, and promote integrated innovation and integrated application. It is necessary to strengthen the construction of talent team, establish and improve the talent training system, create various forms of high-level talent training platform, and cultivate a number of leading figures and high-level innovation teams.

China supports the exploration of blockchain technology. Since 2016, the state has issued a number of policies on the development of blockchain, especially the "13th five year" National Informatization Plan "which

takes blockchain as a key cutting-edge technology. At the same time, Shanghai, Guangzhou, Shenzhen, Chongqing, Zhejiang, Jiangsu, Guizhou and Shandong released policy guidance information.

At present, the practical application of enterprises focuses on the field of crypto currency, which belongs to the virtual economy. In the future, the application of blockchain will go from virtual to real. More traditional enterprises will use blockchain technology to reduce costs, improve cooperation efficiency and stimulate the growth of real economy, which will be the main battlefield of blockchain application in the future.

Different from the public chain, in the enterprise application, we pay more attention to the control, regulatory compliance, performance, security and other factors of the blockchain. Alliance chain and private chain, which are strong management blockchain deployment mode, are more suitable for enterprises to use in application landing, and are the mainstream technology direction of enterprise applications.

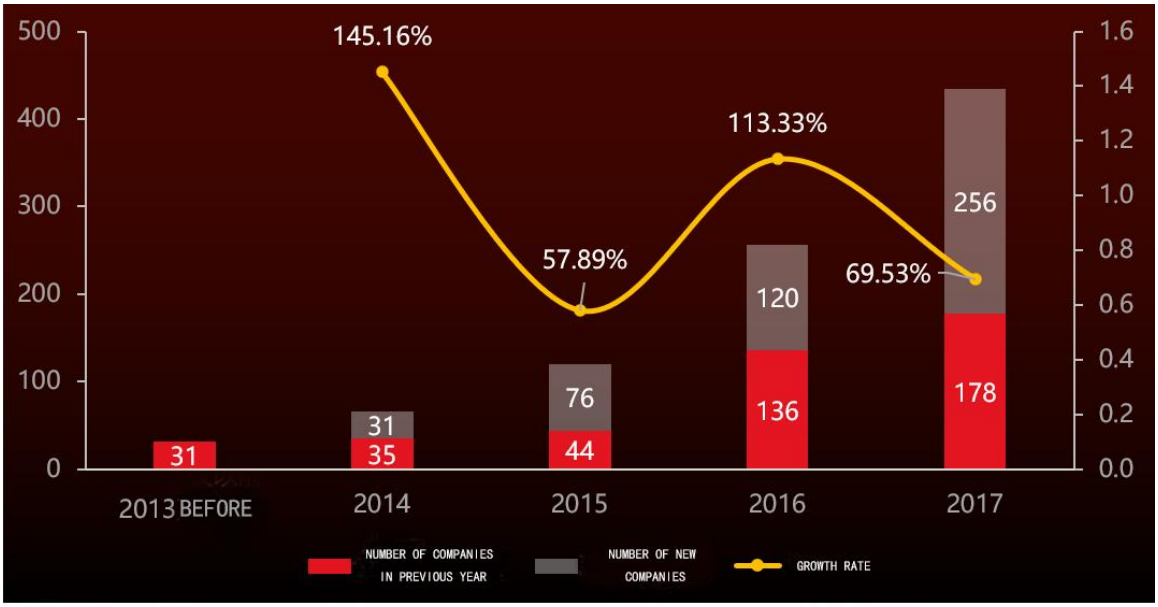
1.4 Development status of blockchain industry and technology

1.4.1 Development status of blockchain industry

The core of the blockchain is bookkeeping. By establishing a decentralized public account with multiple participation in bookkeeping and supervision, the upstream and downstream of the industrial chain are connected, the upstream and downstream data chains of the industrial chain are interconnected, and the innovation chain, application chain and value chain are interconnected and integrated. Based on the data structure, consensus algorithm and contract code of the unified standard of blockchain, we can build a whole set of new digital information platform for industry collaboration and industrial chain integration and innovation. So, "machine small data, industry big data" is a new way of thinking and new direction for blockchain to land in the digital economy, break the industry data island, and realize the collaborative innovation and development of the whole industry. "Industry big data, industry big application" is also the main development direction of blockchain's long-term and healthy development.

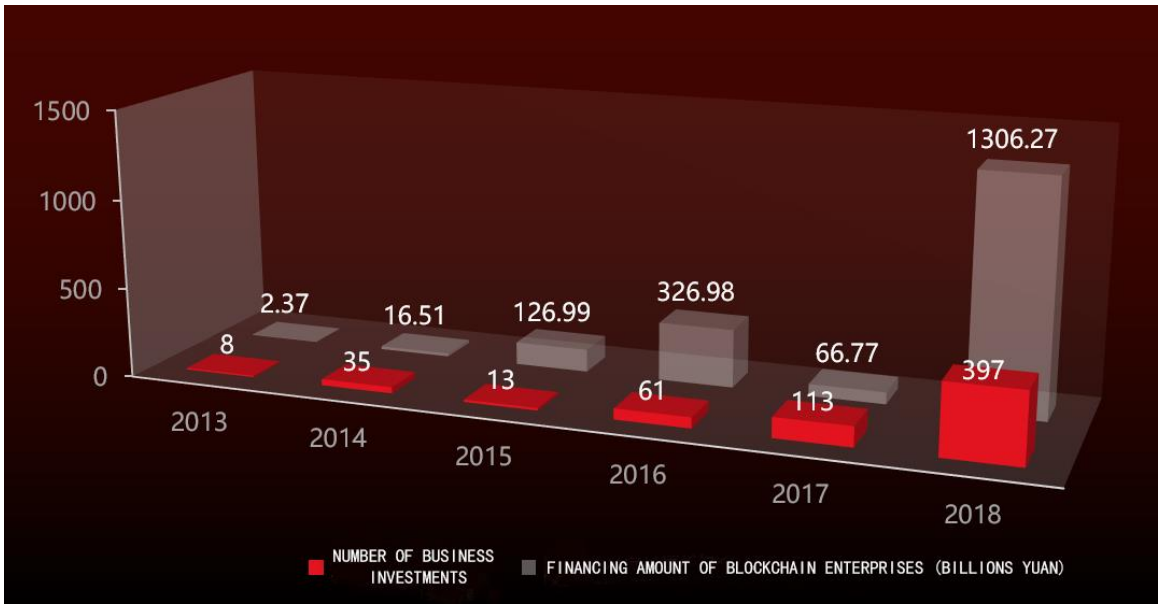
For this reason, the blockchain technology drives the rapid development of the industry and the data of blockchain enterprises. According to the 2018 China blockchain industry white paper, by the end of March 2018, the number of blockchain companies mainly engaged in blockchain

business in China has reached 456, and the industry has initially formed a scale. 2017 is the peak period of blockchain entrepreneurship in recent years. Due to the rapid popularization of the concept of blockchain and the gradual maturity of technology, many entrepreneurs swarmed into this field, and the number of newly established companies reached 178 (see the chart below).

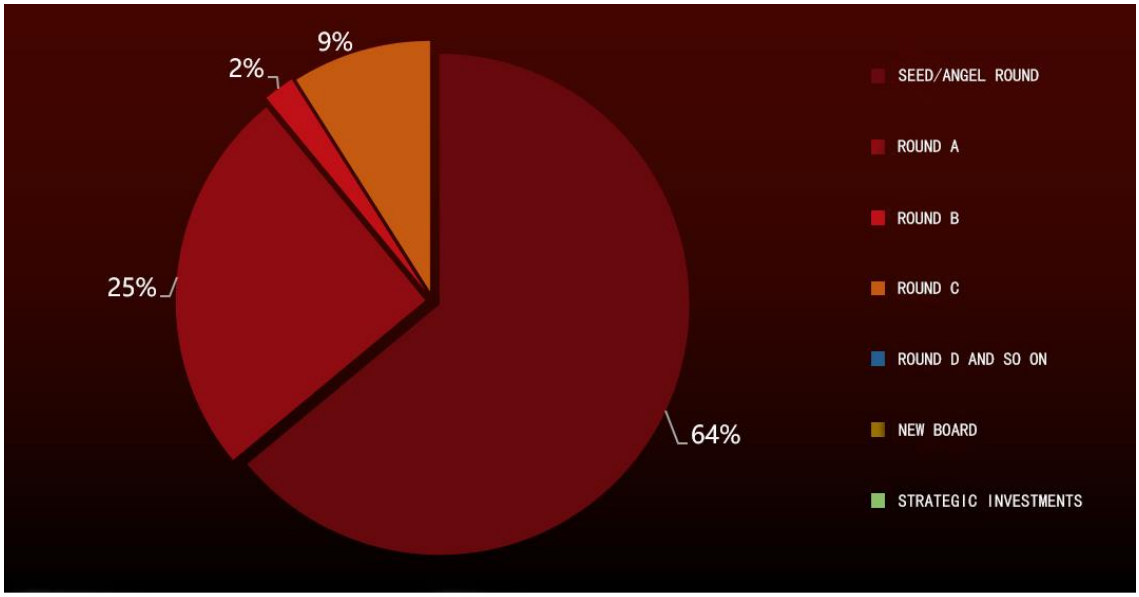


SOURCE: 2018 WHITEPAPER IN BLOCKCHAIN INDUSTRY CHINA

The amount of investment and financing increased significantly. From 2013 to 2018, the number of investment and financing scale of blockchain related enterprises in China have been on the rise. In 2018, the number of blockchain related enterprises' investment has increased explosively, from 113 in 2017 to 397; the financing amount has increased from 6.677 billion yuan in 2017 to 130.627 billion yuan in 2018 (see the figure below).



The blockchain industry is in its infancy. According to the distribution of financing rounds of China's blockchain companies, nearly 90% of investment events are concentrated in the early stage (round a and before), and 9% of investment events belong to strategic investment round B and later only account for 2% (see the figure below). Therefore, the blockchain industry is still in the early stage.



SOURCE: 2018 WHITEPAPER IN BLOCKCHAIN INDUSTRY CHINA

1.4.2 consensus mechanism

How to reach consensus efficiently in the distributed system is an important research problem in the field of distributed computing. Just as the opposite relationship between "democracy" and "centralization" in the social system is similar, the more decentralized the decision-making power, the lower the efficiency of reaching consensus, but the higher the stability and satisfaction of the system; and the more centralized the decision-making power, the more likely the system is to reach consensus, but at the same time it is more prone to autocracy and dictatorship 。 One of the core advantages of blockchain technology is that it can effectively reach a consensus on the validity and consistency of block data in the decentralized system with highly decentralized decision-making power.

Due to the high network delay in point-to-point network, the sequence of transactions observed by each node can not be completely consistent. Therefore, the blockchain system needs to design a mechanism to reach a consensus on the sequence of transactions occurring in the same time. This algorithm to reach a consensus on the sequence of transactions in a time window is called "consensus mechanism".

At present, there are various consensus mechanisms in the blockchain industry:

(1) POW

POW consensus mechanism is an important innovation, which integrates the functions of bitcoin system, such as currency issuance, transaction payment and verification, and ensures the security and decentralization of the system through computing power competition. However, the pow consensus mechanism has obvious defects at the same time. The waste of resources (such as electricity) caused by its powerful computing power has always been criticized by researchers, and the 10 minute transaction confirmation time makes it relatively unsuitable for small transaction business applications.

The advantages of pow algorithm include complete decentralization, free in and out of nodes, simple algorithm, easy to implement, no need to exchange additional information between nodes to reach a consensus. High security, the destruction of the system requires a huge cost, allowing 50% of the nodes in the whole network to make mistakes.

POW algorithm also has many disadvantages. First, it needs a lot of computing power. At present, bitcoin has attracted most of the computing power in the world. Other blockchain applications using POW consensus mechanism are difficult to obtain the same

computing power to ensure their own security. The new blockchain must find a different hash algorithm, or it will face bitcoin computing power attack. Mining results in a large amount of waste of resources, relying on the mathematical operation of machines to obtain the right of accounting, and resource consumption is higher than other consensus mechanisms. The consensus has a long period of time and is not suitable for commercial applications. It has weak regulatory ability and security risk. At the same time, the emergence of super large ore pools also highlights the problem of computing power concentration, that is, "51% attack" risk. The performance and efficiency are relatively low. Each time a consensus is reached, the whole network needs to participate in the operation. Unable to reach a final agreement, it is easy to produce a fork, and needs to wait for multiple confirmations.

(2) POS

As an upgrade consensus mechanism of pow, POS mainly solves the problem of waste of pow workload calculation. At present, POS has many different varieties, but the difficulty of mining is basically determined by the number and time (i.e. equity) of tokens held by each node. According to the proportion and time of tokens held by each node, the difficulty of mining is reduced in equal proportion, so as to speed up the search for random numbers.

Compared with pow, POS algorithm has the advantages of avoiding a lot of waste of resources caused by mining, shortening the time of reaching consensus among nodes, realizing millisecond level if the network environment is good, and requiring low performance of nodes.

The disadvantage is that mining is still needed, and POS will make "the rich richer". It is possible to control the bookkeeping power, and the participants with rights and interests may not want to participate in bookkeeping. Unable to reach a final agreement, it is easy to produce a fork, and needs to wait for multiple confirmations. POS is still a way to obtain bookkeeping rights based on hash operation competition, with weak regulatory ability and the same fault tolerance as pow.

(3) DPOS

The principle of dpos is the same as that of pos. the main difference is that the node elects several agents and the agents take turns to verify and account. Its compliance supervision, performance, resource consumption and fault tolerance are similar to POS.

Compared with POS, dpos has the advantage that it can greatly reduce the number of nodes participating in verification and accounting, and can achieve second level consensus verification. The disadvantage is that the whole consensus mechanism depends

on tokens, and many commercial applications do not need tokens.

(4) RPCA

The blockchain created by Rayleigh wave consensus protocol is maintained by some trusted nodes of all participants, which are called "gateways". At the same time, there is a trust relationship between gateway nodes, while the rest of the general participants are called "users". Users can only generate transactions, and do not participate in the work of creating blocks and recording transactions.

The advantages of the Rayleigh wave consensus mechanism include that the confirmation transaction can be verified in a very short time, a block can be generated every 3 seconds or so, and no hard fork will be generated at any time.

Disadvantages include high reliability requirements for gateway nodes, which will affect the normal operation of the whole transaction network. Due to the existence of gateway nodes, it can not be regarded as a complete "decentralization", and it takes a long time for new joining nodes to achieve consensus with other nodes.

(5) PAXOS

Paxos belongs to the traditional distributed consistency algorithm, which is a consensus mechanism based on the election of leaders. Paxos can ensure that the system can reach consensus when more than 50% of normal nodes exist.

The advantages of Paxos consensus mechanism include high performance and low resource consumption, allowing strong supervision nodes to participate. The disadvantage is that it is only used in distributed systems with high fault tolerance.

(6) PBFT

Pbft solves the problem that the efficiency of the original Byzantine fault-tolerant algorithm is not high, which makes the Byzantine fault-tolerant algorithm feasible in practical system application, and the number of fault-tolerant nodes is n / 3-1. Similar to Paxos, it is also a consensus mechanism that allows Byzantium to vote with permission and the minority obeys the majority to elect leaders for bookkeeping, but this consensus mechanism allows Byzantium to be fault tolerant.

The advantages of PBFT consensus mechanism include high efficiency, block out in seconds, which can be configured to block out in one to several seconds to meet the needs of short-term response of transactions. It allows strong supervision nodes to participate and has authority classification ability. Compared with Paxos, it has higher performance and lower energy consumption. The algorithm has high security, each round of accounting will be

led by the whole network nodes, allowing 33% of nodes to do evil, and the fault tolerance is 33%. High consistency, high availability, strong anti fraud ability, is a more practical consensus algorithm in the alliance chain.

Disadvantages include that when one third or more bookkeepers stop working, the system will not be able to provide services. When 1 / 3 or more bookkeepers do evil jointly, and all other bookkeepers are just divided into two network islands, the malicious bookkeeper can make the system bifurcate, but will leave cryptography evidence.

(7) RAFT

Raft pays more attention to the comprehensibility and landing of the protocol, which is characterized by at most one legal leader at any time, and the number of fault-tolerant nodes is n / 2-1. Raft algorithm is a simplified implementation of Paxos algorithm, so its compliance, performance, resource consumption and fault tolerance are similar to Paxos.

Compared with Paxos and pbft, pbft consensus mechanism has the

advantages of higher performance, lower energy consumption and second level block output, which can be configured as one or more seconds block output. With high consistency, more than half of the candidate blocks are submitted to the blockchain. High availability. If more than half of the reply tickets are not collected after the timeout, the election will be re launched to ensure the fault-tolerant recovery ability of the system. It supports 1 / 2 node fault tolerance, and the failure of less than 1 / 2 nodes in the whole system will not affect the consensus. High data security, strict verification signature in the election process and block synchronization process.

The disadvantage is that compared with Byzantine fault tolerance of pbft consensus, raft consensus does not strictly guarantee anti fraud, and is suitable for alliance chain with high mutual trust

(8) POOL

The pool consensus mechanism is based on the traditional distributed consistency Technology (PBFT, Paxos, raft, etc.) and data validation mechanism.

Its advantage is that it can work without token. On the basis of mature distributed consistency algorithm, it can realize second level consensus verification. The disadvantage is that the performance will deteriorate with the increase of the number of nodes, and the degree of decentralization is not high, which is more suitable for multi-party participation in multi-center business model.

The consensus mechanism is not only the algorithm and data consensus between computers, but also the consensus of cooperation among partners. The consensus mechanism enables the participants of the blockchain to jointly account in an agreed way, so as to ensure the correctness, consistency and sustainability of accounting among partners, avoid the impact of a few failed nodes on the operation of the network, and prevent the destruction of a few intentional perpetrators 。In different application scenarios, different consensus mechanisms are needed. However, blockchain industry can not develop well without star application. What can become the blockchain star application must be the people's livelihood application that promotes the improvement of people's living standards, the industry application that promotes the industrial integration and innovation development, the supply chain financial application that promotes the development of general finance, the

smart city application that promotes the agglomeration and development of urban intelligent industry, and the innovative application that promotes the international trade and intellectual property protection.

1.4.3 implementation and application of blockchain Technology

We should use blockchain technology to explore the innovation of digital economy mode, provide power for creating a convenient, efficient, fair competition, stable and transparent business environment, provide services for promoting supply side structural reform, realizing effective docking of supply and demand in various industries, and provide support for accelerating the continuous transformation of new and old driving forces and promoting high-quality economic development.

We need to explore the application of "blockchain +" in the field of people's livelihood, actively promote the application of blockchain technology in education, employment, pension, precision poverty alleviation, health care, commodity anti-counterfeiting, food safety, public welfare, social assistance and other fields, so as to provide people with more intelligent, convenient and high-quality public

services.

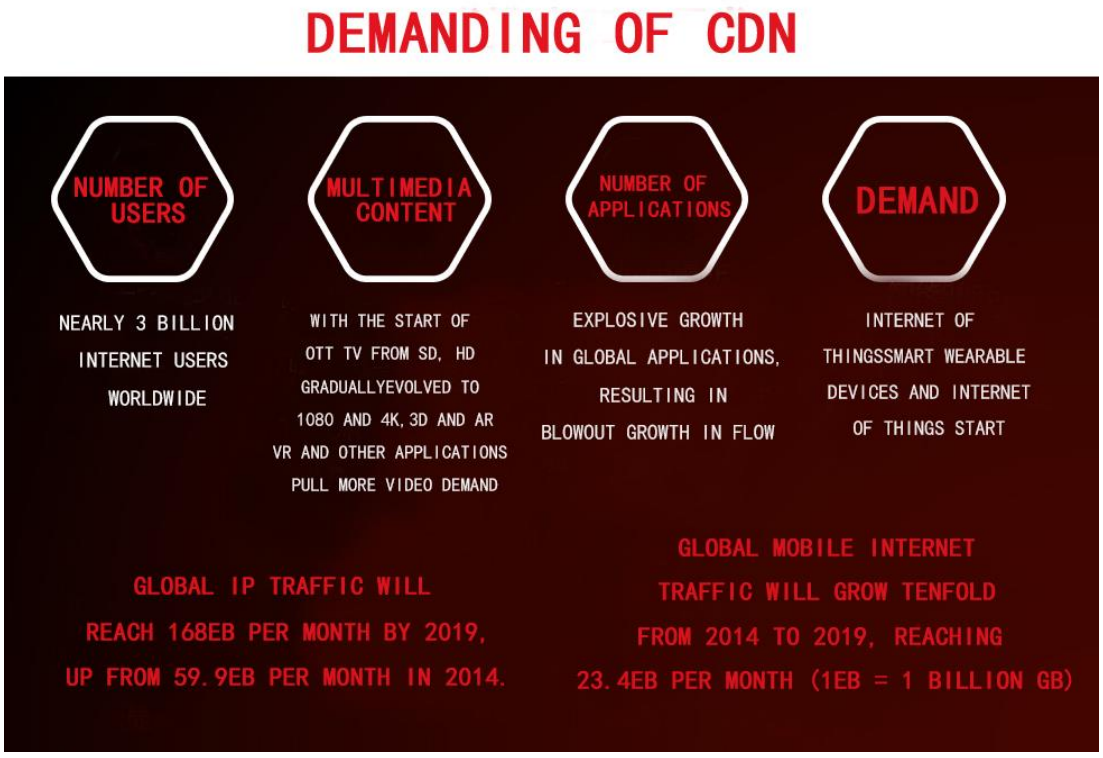
It is necessary to promote the combination of the underlying technology services of the blockchain and the construction of a new smart city, explore the promotion and application in the fields of information infrastructure, smart transportation, energy and electricity, and improve the intelligent and precise level of urban management.

It is necessary to explore the use of blockchain data sharing mode, realize the common maintenance and utilization of government data across departments and regions, promote business collaboration, deepen the "run once" reform, and bring better government service experience to the people.

As the latest science and technology, blockchain serves the improvement of people's living standard, the service ability of governments and institutions in various countries, the comprehensive governance level of cities, the collaborative development of upstream and downstream industry chains, the promotion of productivity, the various links of information services

and commodity trading and circulation, and the promotion of the whole society And national civilization to a new level.

At present, many Internet applications in the industry are platform applications. In the future, with the emergence of new IT basic technology (blockchain Technology), the platform application will form more extensive and efficient collaboration between upstream and downstream industries. To avoid platform monopoly, financial monopoly and technology monopoly affecting the healthy and long-term development of the national economy.

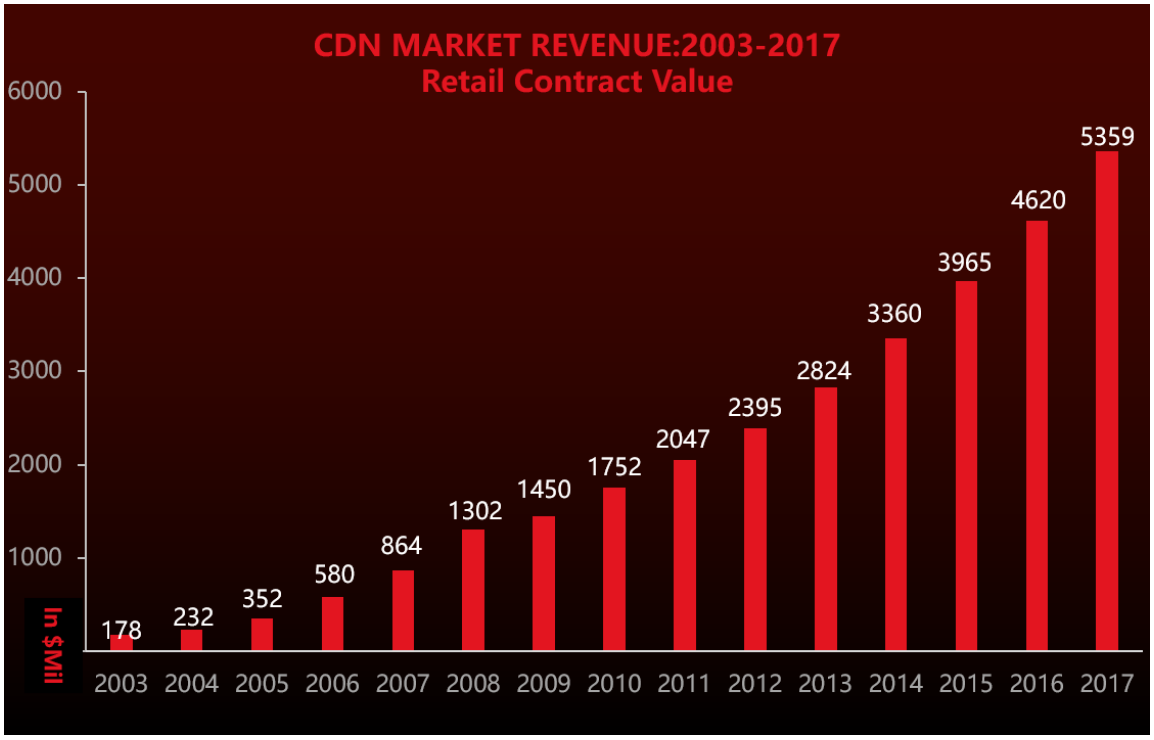


In summary and analysis, on the one hand, blockchain technology is used in the field of science and technology finance to serve the innovation of

financing and value chain, on the other hand, it is used in the cross integration of information technology itself, so that it is widely cross integrated with AI Artificial Intelligence, big data, cloud computing, Internet of things, 5g applications and other various new technologies and applications, and permeates the first industry (agriculture and All fields of energy industry, secondary industry (manufacturing industry) and tertiary industry (service industry), so as to connect all upstream and downstream links in the virtual land of digital economy. And blockchain and artificial intelligence, big data, cloud computing, Internet of things, 5g, virtual reality VR, chips, etc. will promote industry integration and innovation, and finally the industrial chain collaborative application innovation will break out.

1.5 the market scale of CDN mining is increasing year by year

With the development of mobile Internet, live video, 4K HD video and other applications, the user's direct demand for massive data and response time is promoted, and the CDN business is booming. According to the data in the relevant report of micromarketmonitor released by PRWeb recently, the market size of CDN is expected to increase from $3703.4 million in 2014 to $12163.7 million in 2019, with the compound annual growth rate of revenue of 26.9%, and will maintain a high-speed growth for a long time in the future.



The huge market and high-speed market growth rate give TORO a great opportunity to go deep into the industry, provide a revolutionary distributed CDN sharing economy, and connect hundreds of millions of people who are willing to share. CDN is the abbreviation of content delivery network, that is, content distribution network. CDN provides the content needed for the nearby access through the node servers placed in each region, so as to achieve the purpose of acceleration. At present, many blockchain projects have proposed the concept of combining blockchain technology with CDN, that is, introducing Ethereum smart contract, sharing economy and P2P technology on traditional CDN.

This is very close to the concept of TORO distributed deployment node

server. By turning the idle bandwidth and online devices of ordinary users into nodes in CDN network, the number of nodes is increased infinitely. In this way, not only can the node service provider get additional benefits, but also can make the cost of CDN cheaper.

According to the latest industry research report of ICT Institute, the global CDN market has a compound annual growth rate of 27.7% in 2012-2016, reaching 7.05 billion US dollars in 2018, and is expected to reach 15.73 billion US dollars in 2020. From the perspective of revenue contribution, North America is the largest market, while Asia Pacific will be the fastest growing market, which means that the global CDN market scale is increasing year by year, which is one of the important reasons for TORO to build the private cloud of TORO.

1.6 Market pain point of CDN mining and the generation of TORO

1.6.1 Problems of blockchain

Blockchain has been regarded by many experts as the key technology promoter of the whole new business economy and business model. At present, many projects begin to develop blockchain + sharing economy. At the beginning, however, there are many aspects of the public chain in the market that need to be improved:

First of all, the high energy consumption of blockchain mining has been criticized by people. With the increasing popularity of bitcoin, blockchain has gradually become a capital intensive industry with high energy consumption. However, the emergence of TORO has greatly changed this situation. Through the upgrading of technology, TORO only needs to use a very low energy consumption mobile phone to mine. This can avoid the waste of resources and popularize the threshold of mining.

Secondly, there is the problem of storage space volume in the blockchain industry. The requirement of blockchain for data backup challenges the storage space. Blockchain requires broadcasting to the whole network after a transaction is completed, and every node in the system needs data backup. Taking bitcoin as an example, since the creation of the block, the block data has exceeded 60GB, and the amount of block chain data is still increasing, which will bring great challenges to

the operation of bitcoin core client. In view of this, TORO mines and stores data by sharing the idle memory space of mobile phones, thus greatly reducing the requirements for hardware storage space.

The next thing to be considered is the security defect. Due to the lack of mutual trust mechanism between devices, all devices need to check the data of the Internet of things center. Once the database collapses, it will cause great damage to the whole sharing economic network. The distributed network structure of TORO keeps the consensus among devices, and does not need to be verified with the center. So, even if one or more nodes are broken, the data of the whole network system is still reliable and secure.

Finally, the problem of transaction throughput is the problem of processing speed. Bitcoin blockchain currently processes up to 6.67 transactions per second, with a confirmation time of about 10 minutes, which is easy to cause blocking delay of a large number of transactions, and may limit the application of small amount multiple transactions and transactions with high time sensitivity. However, the performance of traditional DAG technology is far from enough if it needs to fully support the management of billions of intelligent devices that simultaneously perform resource sharing online. The public chain of sharing economy, which is closely related to blockchain and Internet of things technology,

has a very high demand for TPS. At present, all blockchain projects to create sharing economy on the market have not yet solved this problem.

But in any case, the most important thing for the project is the commercial landing ecology. It takes a long time to accumulate the upstream and downstream channels, brands and service capabilities in the field of sharing economy. Technically, it is more difficult to integrate the blockchain with the application scenarios of sharing economy. Because when the application of blockchain with the field of sharing economy is combined or more or less, it will involve the Internet of things, that is, the public chain of sharing economy cannot be separated from the support of the Internet of things technology And application. In view of this, TORO chose to start with the mobile mining that is most commonly used in daily families, and build TORO mobile mining into a decentralized Internet of things traffic portal to realize the Internet of things, so as to open up the whole sharing economy and the upstream and downstream of the Internet of things, and finally form a complete business ecosystem.

1.6.2 Problems of CDN project

Traditional CDN and cloud service providers are backbone network architectures, but the backbone network architecture cannot expand the number of data center and computer room nodes, and the CDN speed-up

ability is limited. What's more fatal is that the cost of traditional CDN to build data centers and computer rooms is high, which is ultimately passed on to CDN distributors, resulting in high CDN prices.

Some pain points still exist in CDN industry:

(1) CDN has high upstream and downstream costs, low bargaining power of users and low price transparency.

(2) Content still needs to be controlled. CDN content distribution is the first major function of the Internet. Basically, more than 90% of the Internet content has passed through CDN, which is very easy to spread some bad content. However, the cost of regulatory distribution is not low.

(3) Technological innovation is slow. As a result of scenarios or demands, GSLB, distribution, P2P and other technologies have been available for many years. It can be said that many CDN projects have no significant technological innovation.

(4) The acceleration ability of CDN is low. With the development of distributed CDN, the cost of building backbone network is saved, and the price is much lower than that of traditional CDN. However, because the common distributed CDN is centralized, companies operating CDN collect cheap traffic from users and sell it to users who need CDN

acceleration at a high price. However, due to the imperfect development of nodes, the acceleration effect needs to be improved.

(5) Data fraud, poor customer experience. Because the common distributed CDN stores data in a centralized way, there is a risk of counterfeiting in the background, and neither the miner nor the website owner can be guaranteed. TORO is the first distributed CDN built on the blockchain in the world. On TORO, all traffic data and acceleration data are recorded on the blockchain, and no one can tamper with them. With a large number of nodes around the world, users can be assigned to the nearest node when visiting the accelerated website and respond in real time.

TORO develops a self-service CDN trading market based on Ethereum smart contract, which enables website owners and sharers to trade freely, equally and transparently. In the system of TORO, the acceleration cost of the website owner is 90% lower than that of the traditional CDN, and can get better CDN services, so the advantages of TORO are obvious. Just because there are still a lot of above problems in CDN industry, we are determined to build TORO private cloud and mobile memory sharing mining to improve industry technology and provide a more convenient life for human beings.

1.6.3 TORO came into being

According to the above problems, after a thorough analysis of the existing similar projects, including various promising sharing economic projects, the strengths and weaknesses of each project are summarized. However, it is difficult to find a project that can take all aspects into account.

In view of the limitations of the existing projects, we deeply combined the market demand, optimized the performance of the public chain and developed a complete economic model scheme, so that the distributed storage + TORO blockchain technology makes the decentralized point-to-point protocol storage possible, we established the TORO cloud network to realize resource sharing, and in the sharing process, we distributed TORO communication for each participant in the sharing process according to the algorithm Certificate reward.

We believe that through blockchain technology and mobile mining terminal, TORO can make decentralized sharing economy widely adopted and integrated into a broader commercial economy, decentralize sharing economy and truly realize the concept of "idle resource sharing".

Chapter 2 - Introduction to TORO project

2.1 What is the TORO network

TORO is a basic public chain of data sharing. Aiming at the common problems of transaction congestion and high transaction cost in the existing blockchain, aiming at "speed, win-win and convenience", TORO builds the largest decentralized sharing economy and business application ecology in the world. DAG technology is used to support massive concurrent transactions and faster transaction confirmation, so that the sharing economy and even the Internet of things can be realized For reality.

TORO is committed to subverting the rules of the sharing economy industry in the past, directly connecting the upstream and downstream molecules of the whole ecology with a decentralized structure, realizing the interconnection of all things in intelligent equipment, improving the utilization rate and interactive mobility of intelligent equipment resources, so as to better promote the sharing of idle resources in society and protect the interests of data producers. In the future, TORO will decentralize the sharing economy and truly realize the concept of "idle resource sharing" through blockchain technology and mobile mining as the most important entry point.

Through information transparency, smart contract exchange, cloud node, distributed TORO transaction, super node, new currency circulation and unique smart contract design functions, TORO has formed a strong internal structure in the early stage of TORO. Its internal financial balance, community promotion, business docking, value precipitation and network expansion will subvert the underlying centralized business model Concept. In the end, TORO will become a business finance cloud network for use all over the world. In this open network, through the joint efforts of the community, create a new, decentralized business free cloud node.

In terms of operation strategy, TORO takes the win-win of decentralized community as the guiding principle, and encourages users through TORO as the main force for project initiation. The system follows the principle of decentralization and weakens the community influence of the development team to the maximum extent, which creates more space for the long-term development of TORO.

TORO brings not only a new blockchain product, but also a completely decentralized financial cloud system, a truly subversive commercial financial practice. TORO will rely on unparalleled business and financial cloud logic to show the value of a superior system over any business model that the public has seen.

2.2 New generation mobile mining leader

Globally, the Internet has accelerated the digitization of assets. But in this process, we are subject to its opacity and the limitations of the Internet itself. At this time, the asset security and trust crisis has become the biggest threat to personal assets. The emergence of blockchain makes quite a lot of people see a promising future.

In today's society, people realize that most social conflicts are caused by centralization. Perhaps, decentralization is the only antidote. Blockchain technology perfectly solves this global trust crisis, and encryption technology finds a way for our asset security. There is still a long way to go for the application of blockchain technology. More and more people begin to pay attention to the application value of blockchain, which is also the original intention of our design and development of TORO. I hope our efforts can open a new window for the world and become a significant social practice.

TORO mobile mining is a smart terminal based on TOROcloud cloud network, which makes incentive system for users through smart contract. It can obtain the reward of TORO license by sharing idle hard disk space and bandwidth through distributed cloud storage and cloud computing.

Mobile mining is the first intelligent terminal of sharing ecological

software version launched by TORO ecology. TORO has reached business strategic cooperation with many operators, and is committed to building mobile mining into the first traffic entrance of sharing economic ecological business landing.

2.3 Advantages of TORO mobile mining

Lightweight data sharing mining

Support mobile phones as Internet of things intelligent terminals and mining machines

New DAG public chain with a speed of 1000ms between stations supports high concurrent transactions, and the transaction is confirmed at a high speed - hash algorithm: cryptontight & blake2b - consensus protocol: cheetah-TORO cloud, shared storage, multiple intelligent device incentive mechanisms - multi platform wallet, light wallet and other applications

The Ulam consensus can achieve super fragmented nodes

Complete decentralization

It will never produce the same computing power concentration as bitcoin

49% fault tolerance rate of malicious nodes

High TPS

Anti branching

Resist quantum attack

Natural promotion of public consensus and participation

Chapter 3 – Applications and ecosystem of TORO

3.1 Landing application scenario

3.1.1 Mobile mining DAPP

By installing the memory mining DAPP of TORO mobile phones, users can upload the spare memory space of their mobile phones and share it with others for profit. For example, if the memory space of the mobile phone is 256g, the corresponding maximum amount of money held in pledge mining is 25600 TORO. In addition to contributing the free memory of their mobile phones, users can also sell and transfer the remaining space through DAPP.

In addition, TORO DAPP also has a variety of functions such as community, market, exchange, etc., striving to create a real social mobile memory mining project, starting from sharing the free memory of mobile phones, so as to truly realize the concept of idle resource sharing.

3.1.2 Private cloud

Mobile mining supports the establishment of private cloud belonging to individuals. By installing mobile mining equipment and app and importing device SDK, users can directly convert their smart devices into cloud disks without third-party operation under decentralized network.

The early type of terminal is official mobile mining. The future type of terminal includes but is not limited to smart router and machine Top box, network TV, old but still sound smart phones, as long as they can meet the definition of smart devices, can provide personal cloud services for holders after importing the function of TORO device node, providing remote backup, remote call and remote setting functions.

Before more users use the function of TORO to develop more diversified personal cloud services, users can use the client app officially provided by TORO to the app store, such as Google play and app store, bind and associate with the device app, set the location of the storage area and its space size, back up the files of the terminal where the client app is located to the device node, or under the files in the device node Loaded to the location of the client, the user can also remotely and dynamically set the bound device node terminal.

The file separator of the device storage space temporarily exists through the cloud backup. When the three-month period expires, it will appear in the "cloud backup folder" of the device holder's personal cloud interface. At this time, the device holder has the right to delete files to restore the storage space, so that the data and files generated by the distributed backup will not eventually become annoying digital garbage. Because

TORO adopts the advanced encryption and compression technology, it ensures the data privacy of the owner; secondly, the file is divided and cannot be executed, so the device holder does not have to worry about the security problem of the network caused by the virus of the intelligent device.

3.1.3 “Blockchain+VR” Game - Roman Empire

TORO network will launch a large online VR game - Roman Empire. Roman Empire is the first large-scale "Blockchain + VR" immersive historical strategy game on the TORO chain with the ancient Rome as the dream scene. Players enter into the TORO network with the ancient Roman Empire as the background through VR devices.

The game is about the story of Spartacus slaves. Alexander, Hannibal and Caesar, these great men once shaped the fate of a continent. Powerful kings, wise generals and possible gods left their mark on the sea in ancient times. Around this sea, close countries have tested their courage and virtue in the fierce battle. Their cultural and political heritage is inseparable from the rise of Western civilization.

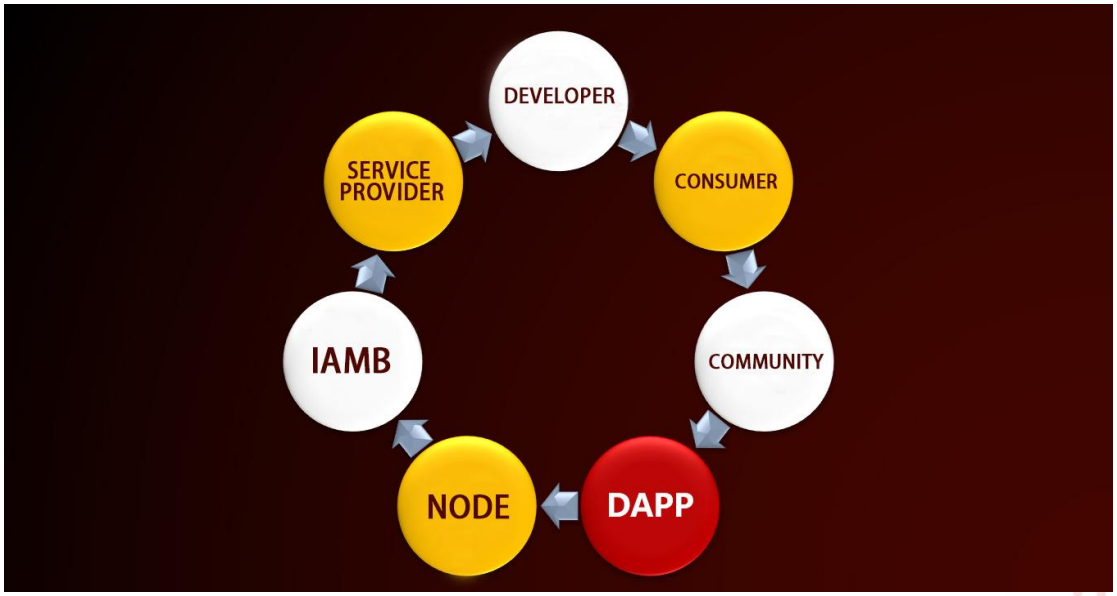
In this turbulent historical event, slaves and peasants revolt one after

another everywhere. You can choose an European city as the base and play the roles of emperor, aristocrat, general, soldier, businessman, etc. according to how much of TOROs you are holding. In this TORO world, you can play your own skills according to your social status, make achievements and bring peace to the chaotic ancient Roman Empire!

3.2 Overview of TORO application ecosystem

3.2.1 TORO chain

The architecture design of TORO chain and TORO platform completely solves the problems of insufficient blockchain performance, high cost and difficulty in developing blockchain, waste of computing power, interaction with the real world, etc., mainly including the following ecological structure:



●**Node**

The administrator of TORO chain has decision-making and governance power. The node is not only responsible for operating the infrastructure of various chains, providing computing power and R & D support for the ecology of TORO chain, but also responsible for the daily operation, major decisions and business environment governance of TORO chain.

- **supervision organization**

The important participants of TORO chain can be institutions or individuals. They supervise, audit, certify, grade and arbitrate the business behaviors in TORO chain.

- **third party service providers**

Third party providing product related services based on TORO chain.

Developers

Important participants of TORO chain, they can be companies and individuals. They provide development services in TORO chain, including the development of smart contracts and the development of DAPP.TORO chain requires that any smart contract deployed to the ecosystem must be registered in the governance contract and signed by the developer.

Consumer

Individual users who use decentralized applications or services on TORO chain through DAPP, web applications, wallets and other channels.

Community

TORO chain values the power of the community. TORO chain will absorb technical talents from institutions and individual communities at home and abroad through the application of community, providing strength for the technical realization and technical iteration of TORO chain.

DAPP

The quality and innovation of DAPP determine the vitality of a blockchain ecosystem. In order to help developers get started with the development of DAPP faster and speed up the development of developer ecosystem, TORO chain will rely on its rich resources to incubate various DAPP applications related to small and medium-sized enterprises in the chain.

3.2.2 TORO miner and client

(1) Software version

Software mining client, DAPP, is one of the effective ways for sharers to share idle memory. No need to add additional hardware equipment, run mining client on the terminal where mobile phone can share traffic,

people can continuously provide shared memory space throughout the day, and obtain equivalent TORO according to the size of memory space provided. In the future, TORO will develop more applicable scenarios other than mobile phones for software mining clients, such as PC version, router, etc. No matter in walking dogs, shopping, eating, watching movies, the software mining client is providing you with revenue!

(2) Mining machine

TORO Mining machine is a mining hardware designed by TORO network for high-end players. Mining machine built-in mining software, can be turned on all day. Based on the intelligent scheduling DNS technology, TORO mining efficiency leads the market in similar products. Players only need to connect to the computer, configure their TORO wallet address, connect to the broadband, you can automatically mine. At the same time, TORO mining belt has family private cloud function, which can provide users with private cloud services, and provide remote backup, remote call, remote setting and other diversified functions. At present, the Mining machine is still under research and development, and it is believed that it will go online in the near future.

3.2.3 TORO wallet

TORO wallet is a decentralized aggregation payment ecological wallet, which is an important tool for users to store and use TOROC token.

TORO wallet will provide mobile phones, PCs, web and other versions of wallets, so that users can safely store their own TORO crypto assets. TORO wallet will integrate convenient payment, fast conversion and secure storage services.

TORO wallet is unable to retrieve the password, transaction rollback and other operations. The private key is in your own hands and users need to keep it properly. The user's crypto assets are stored and transactions are recorded in the blockchain network ledger, not in the server of TORO wallet. Only those who master the private key can control it.

With the promotion of the TORO wallet project and the widespread use of the TORO crypto assets, the TORO wallet can finally achieve:

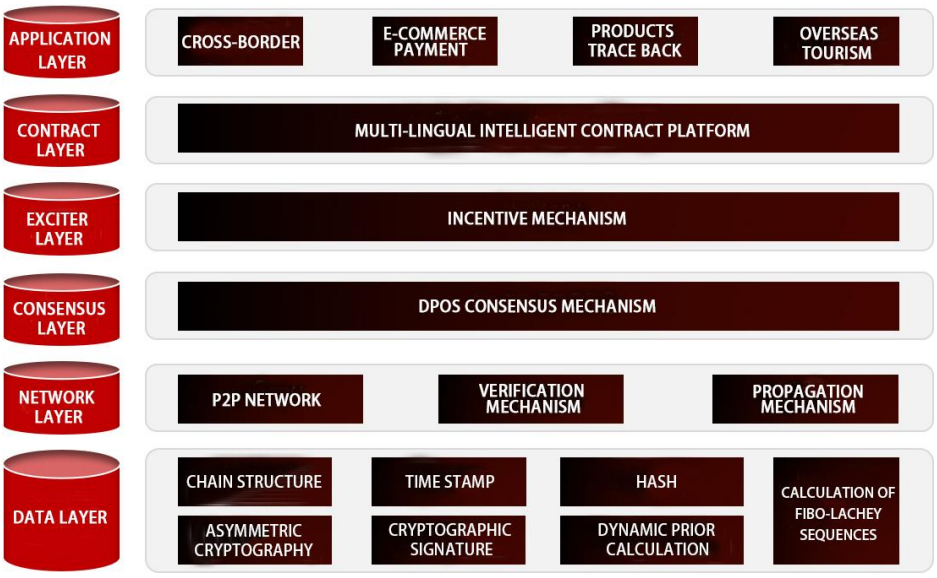
- real time settlement of overseas consumption payment of TORO crypto assets;
- TORO crypto assets daily convenient payment real-time settlement;
- exchange settlement between TORO crypto assets and mainstream traditional equity and mainstream crypto assets;
- TORO crypto asset management.

Chapter 4 - TORO technology innovation system

4.1 Overall technical framework of TORO

TORO adopts the elastic blockchain design structure of main chain + side chain. The main chain is responsible for basic transactions and transfer payments, while the side chain is responsible for executing smart contracts to support applications and services in various scenarios. Through the flexible side chain, different industries, applications and services are deployed in different side chains to meet different value needs.

The TORO technology architecture is divided into data layer, network layer, consensus layer, incentive layer, contract layer and application layer from bottom to top. Each level can serve a certain application, meet the specific needs of different applications, and help users quickly and safely realize various business application scenarios.



4.1.1 TORO data layer

In addition to the standard blockchain chain structure, Merkle tree, hash function, asymmetric encryption and timestamp technology, the data layer also introduces dynamic priority computing, fiboracci sequence computing, cryptography signature evidence and other technologies. At the beginning of the design, the traditional blockchain data structure did not fully consider the scalability, resulting in the inability to accommodate large-scale data, and the lack of flexibility in the structural design, resulting in the existing blockchain technology under the chain data structure is only suitable for crypto currency circulation.

4.1.2 TORO network layer

In order to enhance the network capacity and improve the network transaction processing speed, the network layer adopts P2P networking mode. P2P protocol supports the data transmission and signaling exchange of each node in the blockchain network, which is an important communication guarantee for data distribution or consensus mechanism. In the system design, TORO can be used flexibly according to different scenarios, supporting a variety of P2P protocols. In terms of communication security, it can flexibly support HTTPS / TLS and other security communication protocols.

4.1.3 TORO consensus layer

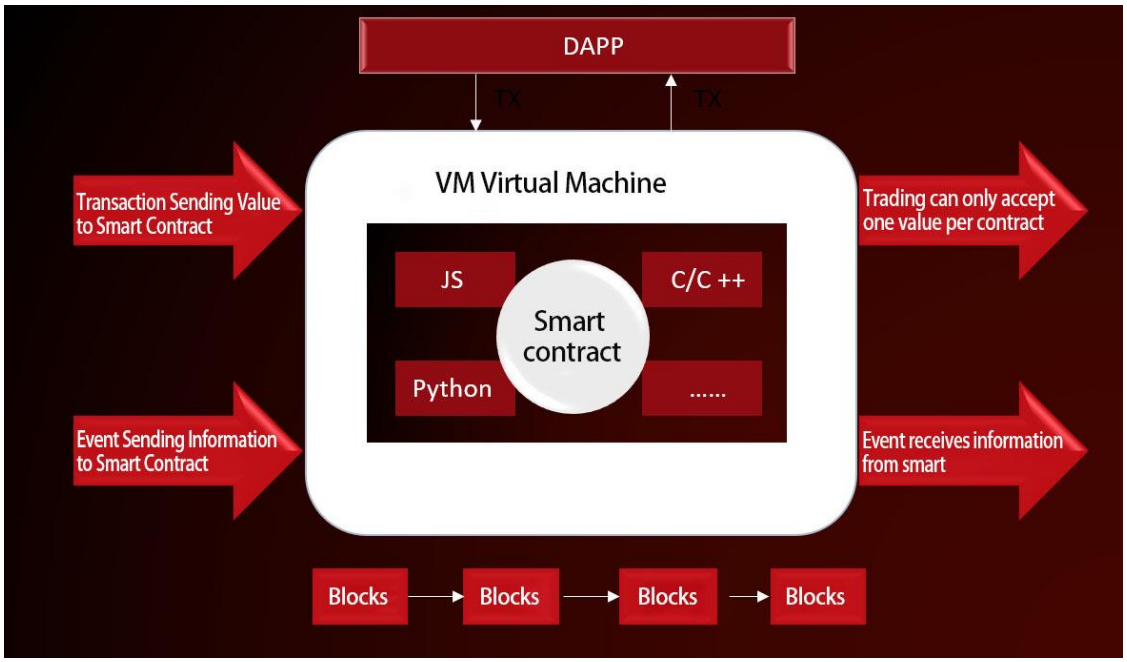
The consensus mechanism adopted by TORO is based on dpos, and it also uses the system of principal election. However, in the second half of the algorithm, an optimized pbft algorithm variant is adopted. When T < n / 3, with O (n ^ 2) message complexity and O (1) time complexity, loyal nodes can reach an agreement without bifurcation. T Indicates the number of Byzantine nodes (i.e. nodes that may have arbitrary behaviors, such as network delay, downtime, malicious attacks, etc.), and N indicates the number of all nodes.

4.1.4 TORO incentive layer

Transaction is the basic transaction for the change of rights and interests on TORO. Any transaction needs to consume TORO. In addition to the direct asset income rewards, there are also bookkeeping contribution rewards in the TORO incentive bookkeeping node. Bookkeeping contribution rewards will become an equity basis for bookkeeping again. In addition, with the continuous improvement of TORO technology and ecology, the value of TORO will continue to increase.

4.1.5 TORO contract layer

In TORO ecosystem, secure smart contract is a chain object which contains code, data storage, bionic intelligent reference model and bionic intelligent decision rules. The contract maker can describe the contract terms by language, define the bionic intelligent rules of the contract and the bionic intelligent reference model, set the execution conditions, as well as the operation and participation interface after the execution conditions are met. After the contract drafter registers the contract with TORO, other users will participate in the contract through the calling interface.



TORO designed its own special virtual machine, TORO VM, in order to improve the performance, reduce the contract development cost, and optimize the memory allocation model. In the future, TORO will launch the support of various programming languages based on the TORO

certificate VM to create a friendly development environment. Developers can program in their favorite high-level languages, such as Java, python, go, JavaScript, etc.

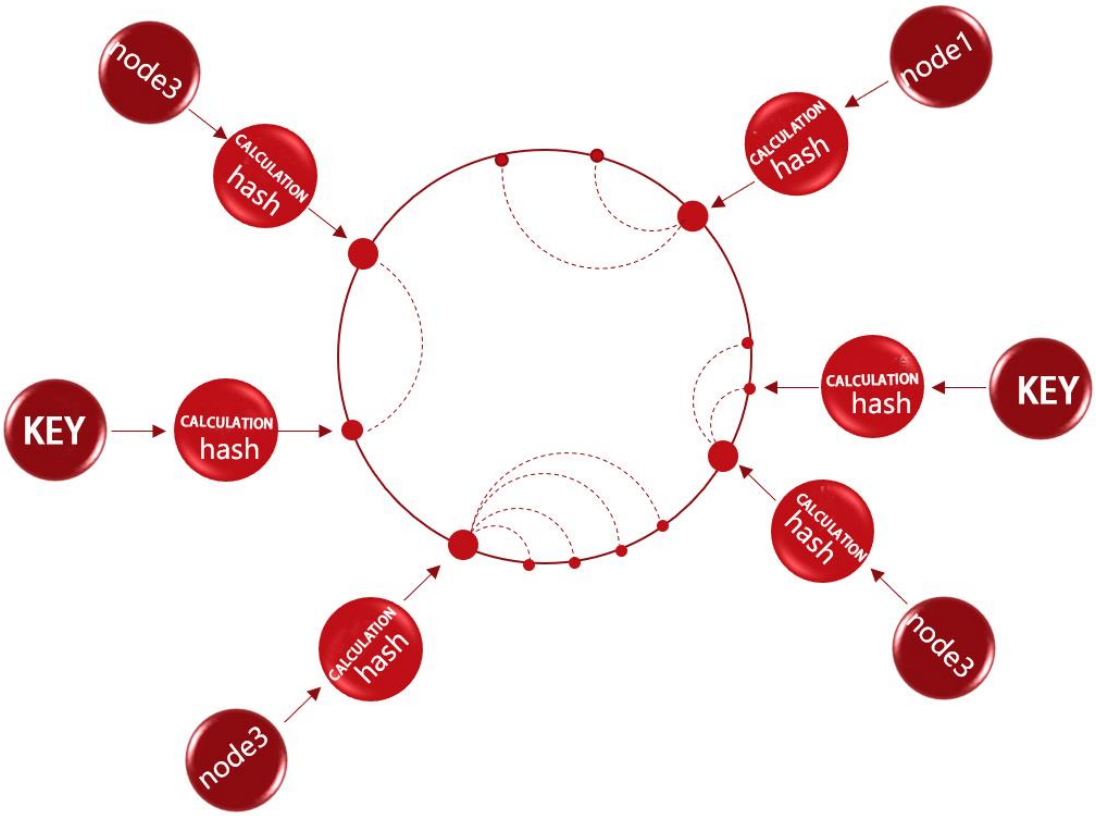
4.1.6 TORO application layer

DAPP ecology of application layer end user involves many related applications such as TORO wallet, resource distribution, community, etc. The application layer of TORO will provide an open data interface system for service providers in the ecosystem. For different applications, TORO will have special and general interfaces for the application layer to call directly.

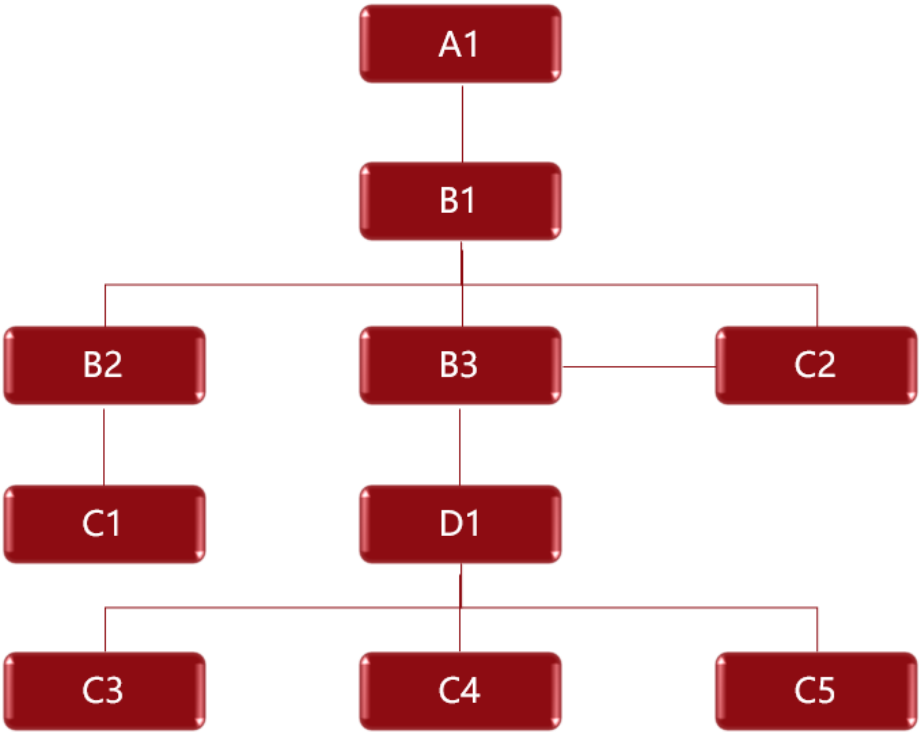
For relevant service providers, access mechanism and core application ecology shall be established. When the TORO resources and energy ecology are sound, access conditions will be opened at the public chain application layer, and the TORO will be used as access fuel.

4.2 TORO Distributed hash table

TORO The hash table is divided into discontinuous blocks, each node is assigned a hash block of its own, also known as interval table, and becomes the manager of the hash block. When the user stores data, the system performs hash operation on the data, determines which node is responsible for storing the data according to the result of hash operation, and generates a hash table. When the user extracts the data, he uses the same algorithm to calculate the hash of the data, and then looks up which nodes have saved the corresponding content from the hash table.



The object graph of path access is as follows:



The A1 object addressing logic in the figure is:

"data":

["tree", "blob", "tree", "list", "blob" "blob"],

"links": [

{ "hash": "<B2-hash>", "size": 7548

"name": "B2-name" },

{ "hash": "<C1-hash>", "size": 4152,

"name": "B2-name/C1-name" },

{ "hash": "<B3-hash>", "size": 1459,

"name": "B3-name" },

{ "hash": "<D1-hash>", "size": 479,

"name": "B3-name/D1-name"},

{ "hash": "<C2-hash>", "size": 99,

"name": "B3-name/D1-name/C2-name" },

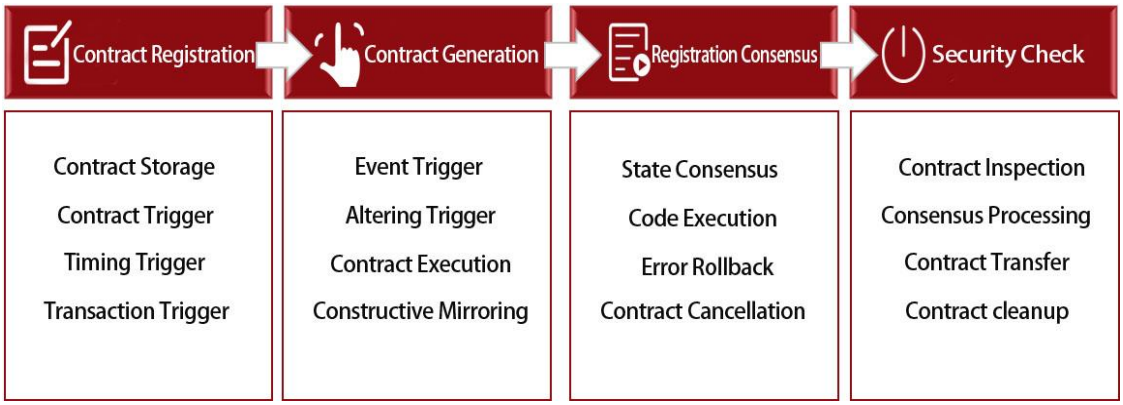
{ "hash": "<C2-hash>", "size": 99

"name": "C2-name" }

4.3 Intelligent contract

TORO blockchain contracts include standard contracts and customized contracts. Standard contracts include relatively simple contracts such as asset consistency check, automatic transaction matching, transfer confirmed by multiple parties, and automatic liquidation upon maturity. They are built-in contracts of TORO blockchain and can be directly used on the blockchain. User customized smart contracts include modifying configuration and adding other business logic through contract template, and they can also support more complex user self programming contracts to run in an independent environment.

The smart contract consists of four parts: registration, triggering, execution and cancellation, as shown in the following figure：



●Contract registration

Contract registration is the process of storing the consensus to the

blockchain after the user's written contract security check is processed. TORO certification blockchain plans to support multiple languages to write smart contracts in the future.

- contract triggering

Contract triggering is the process of triggering contract execution through external conditions after contract registration. It supports timed triggering, event triggering, transaction triggering and other contract triggering methods. Timed triggering refers to the process of automatically triggering the contract call after the node triggers the time consensus after meeting the preset time in the contract. Events, transactions, and other contract calls are all new request consensus processes that trigger contract execution.

- contract execution

Contract execution is the whole process of contract code running in an independent environment, including contract construction image environment, code execution, consensus of state modification in execution code and exception handling of consensus.

- cancellation of contract

Contract cancellation refers to the transfer and clearing of contracts that have been executed, expired, voided or are no longer needed for business demand changes. The process of clearing can only be completed after multiple nodes have reached a consensus.

4.4 Cross chain interoperability

TORO proposes two kinds of blockchain cross chain transaction architecture, namely, the same structure of the Internet (TORO orbits) and the different structure of the Internet (TORO canal), to realize the interconnection between independent blockchains, and to ensure the effectiveness of cross chain transactions and the security of user privacy data.

With the rapid increase of blockchain users and transactions, TORO orbits aims to solve the following problems faced by the single chain system: the whole network consensus efficiency of the single chain is limited by the scale of consensus nodes, the whole network backup mechanism of the single chain makes the storage efficiency reduce, and the single chain system can not meet the diverse demands of business. The advantages of TOROorbits system are as follows:

(1) Different sub chains can customize key operation parameters of blockchain;

(2) Creation and consistency guarantee of sub chain, separate storage of sub chain ledger;

(3) Overall ledger structure of hash and index;

(4) Free flow of value can be realized between sub chains.

TORO canal aims to realize the leap of different blockchains from "value

island" to "interconnection". In the blockchain world represented by bitcoin and Ethereum, the nodes of each blockchain verify their own chain transactions and establish an independent and vertical autonomous system, which makes these blockchains gradually become "value islands", more and more like a "local area network", and the asset exchange and communication between chains are very difficult. TORO canal aims to establish an extensible and interoperable cross chain system, realize the interconnection between blockchains, transform "local area network" into "Internet", and realize the free flow of value, assets and information among "value islands" of blockchain. The advantages of TORO canal system are as follows:

(1) Bridging the value route of the same / different architecture blockchain;

(2) Global real-time / periodic synchronization of the main chain according to the cross chain state type;

(3) Free flow of value can be realized among different blockchains;

(4) Assume the role of "router" of blockchain and form "Internet" of blockchain.

4.4.1 TORO orbits architecture

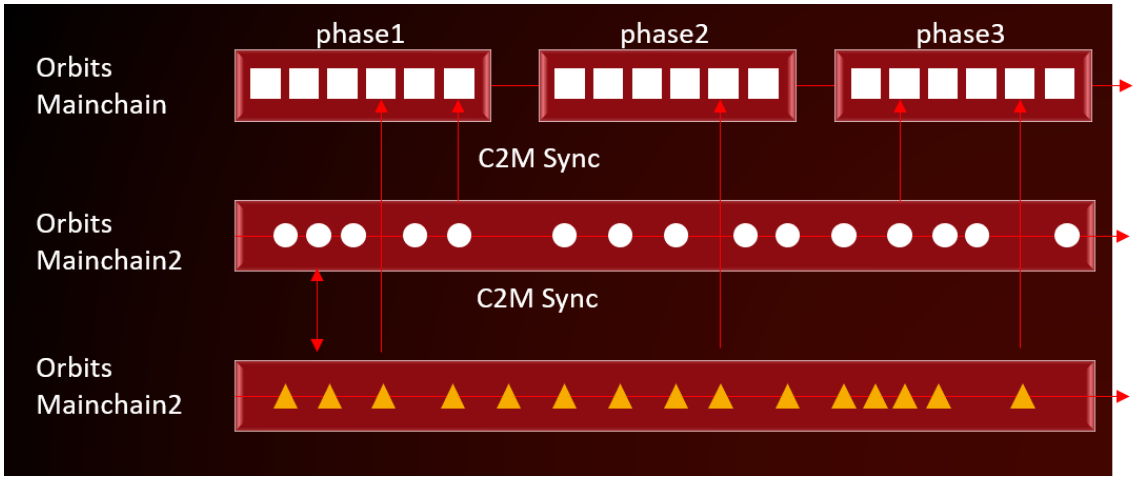
TORO orbits is a two-layer multi-state architecture system, which is

composed of two layers of main chain and sub chain. It distributes transaction processing, state storage, transaction download and broadcast across sub chains and nodes. TORO orbits blockchain mainly consists of two types of chains: one is the main chain with only one main chain; the other is the child chain with multiple sub chains. The underlying technology of the main chain and the sub chain can share the same blockchain architecture, account tree structure and consensus algorithm system, but in the specific implementation process, technology can be selected according to the application characteristics of the sub chain, such as using different sub chain consensus algorithms, different block size restrictions, etc. The main chain connects all the sub chains. Among the sub chains, you can communicate directly or transfer trust through the main chain. In particular, due to the isomorphism of the main chain and the sub chain of TORO orbits, the sub chain and the sub chain can communicate and trade directly. After the transaction is completed, the consensus can be synchronized in the main chain. Of course, it also supports the transmission of trust between the sub chain and the sub chain through the main chain, which depends on the application scenario.

Compared with a single blockchain system, TORO orbits can significantly increase the transaction processing capacity by expanding multiple sub chains, and help users flexibly deploy differentiated services

according to their needs to provide users with higher quality blockchain services.

TORO orbits consists of two layers. The first layer is the main chain layer, which is composed of nomination nodes and verification nodes. It is responsible for providing high-level main chain consensus for each sub chain and providing cross chain contract services. The block header data of the sub chain is synchronized to the main chain (c2m synchronization) regularly, and is recorded permanently once synchronized. The second layer is the sub chain layer, which contains multiple isomorphic sub chains, and is responsible for directly processing transaction, contract and other data. The sub chain can have its own independent account system and token, and independently carry out the sub chain consensus, or directly carry out the cross chain synchronous communication (C2C synchronization) between the sub chain and the sub chain based on the isomorphic system. There is a mapping relationship between the main chain node and the sub chain node, allowing multiple sub chain mappings, that is, a main chain node can be mapped to multiple sub chains. Only a small part of the evidence of the sub chain must be recorded on the main chain, the transactions on the sub chain are in their own independent space, and the sub chain verification nodes only need to verify the sub chain block data they are concerned about.



The verification node is responsible for packing new blocks, which is a key role in the blockchain. The verification node needs to pledge enough deposit to allow the nominated node to nominate one or more verification nodes that can represent them. Therefore, part of the deposit of the verification node is not owned by themselves, but belongs to the nominated node. It is difficult to predict the election of verification nodes. One way is through two rounds of voting. First, the candidate nodes need to be mortgaged with deposit, and the more deposit, the greater the probability of election. In the first round of voting, the existing verification nodes vote to select the candidate verification nodes; in the second round, the whole network votes to select the final verification nodes from the candidate verification nodes. It will be described in detail in the section of consensus algorithm.

Another method is to nominate nodes and generate them randomly. The

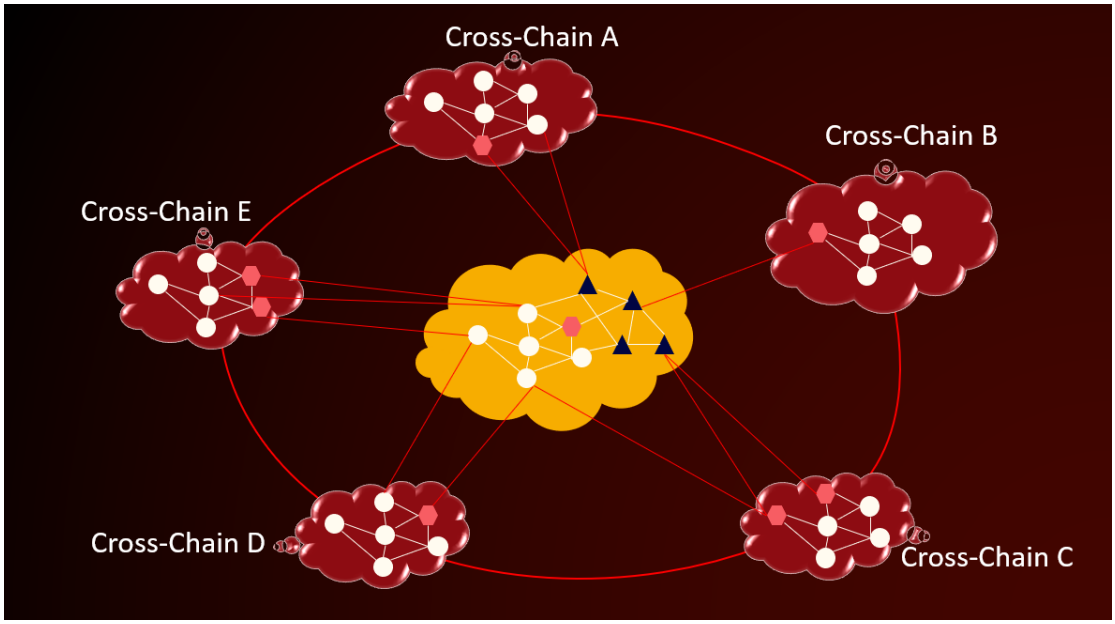
nomination node is a group that selects the verification node and entrusts the deposit to the specified verification node. By trusting one or some specific verification nodes, the verification nodes maintain the blockchain network on behalf of the nominated nodes. According to the deposit proportion of the node, you will get the same proportion of rewards and deductions as the verification node. First, the candidate nodes are sampled by using the block hash as the seed. Basically, the verification nodes deposit their deposits into the main chain cross connection contract service, and then the verification nodes will be recorded in a global verification node list. Then, the system will randomly sample a sub chain of verification nodes from the list of verification nodes. This way, verification nodes cannot predict in advance when they will become verification nodes.

The nodes of main chain and sub chain are divided into full node and light node. All nodes are responsible for processing all transactions and maintaining the full status. The light node only downloads and validates block headers and does not process any Transactions unless it needs to read specific information of a specific block. Most nodes run more than one part of the program, including the node program on the main chain and the node program on the sub chain.

4.4.2 TORO architecture

Similar to TORO orbits, TORO canal is composed of two layers of main chain and sub chain. Different from TORO orbits, the sub chains of TORO canal usually do not have the characteristics of isomorphism, and the sub chains cannot communicate with each other directly.

Compared with a single blockchain system, TORO canal can significantly increase transaction processing capacity by expanding multiple sub chains, and at the same time, it can help users to flexibly deploy differentiated services according to their needs, providing users with higher quality blockchain services. The overall structure of TORO canal is as follows:



TORO canal consists of two layers. The first layer is the main chain layer,

which is composed of collection nodes and verification nodes. The verification nodes are responsible for providing high-level main chain consensus for each sub chain, and providing cross chain contract services. The block header data of the sub chain is synchronized to the main chain on a regular basis, and is recorded permanently once synchronized. The collection node takes the role of communication "route", routes the communication data of different blockchains to the target blockchain, and translates the protocol, so as to prevent cross chain overload and cross chain attack through queue control mechanism. Manage the exchange account account in the main chain, add and delete different kinds of assets in the account, and conduct cross chain transaction processing, such as transaction splitting, asset exchange, etc. The second layer is the sub chain layer, which contains multiple isomorphic / heterogeneous sub chains, and is responsible for directly processing transaction, contract and other data. The sub chain has its own independent account system and token. There is a mapping relationship between the main chain node and the sub chain node, allowing multiple sub chain mappings, that is, a main chain node can be mapped to multiple sub chains. Only a small part of the evidence of the sub chain must be recorded on the main chain, the transactions on the sub chain are in their own independent space, and the sub chain verification nodes only need to verify the sub chain block data they are concerned about.

4.5 Privacy Protection

TORO proposes a cross chain transaction privacy protection method based on zksnark algorithm. Zksnark zero knowledge proof algorithm is one of the relatively mature and feasible privacy protection technologies, which has better anonymity. It does not need to trust the central node, nor other users' participation in the network. Users can achieve anonymous transactions by interacting with anonymous currency, thus effectively protecting users' privacy.

In order to convert the transaction validation rules into QAP form, we need to first convert the transaction validation rule function into NP complete language r1cs form: first, abstract the transaction validation rules into complex polynomial form, and then decompose the complex polynomial into two forms: x = y and x = y (OP) Z, Op can be operators such as addition, subtraction, multiplication and division, y and Z can be variables, numbers and subexpressions; second, transform the transaction validation rule function into NP complete language r1cs form The decomposed expression is transformed into a series of ternary vectors (a, B, c). Finally, r1cs form is transformed into QAP form according to Lagrange interpolation. QAP forms are as follows:

$$\left(A_0(\chi) + \Sigma_{i=1}^{m} S_i A_j(x)\right) \cdot \left(B_0(x) + \Sigma_{i=1}^{m} S_i B_i(x)\right) - \left(C_0(x) + \Sigma_{z=-1}^{m} S_i C_i(x)\right) = H(x) * z(x)$$

Because the transaction verification rules of the Internet chain include the verification of signature, calculation of Merkle tree root hash value and other complex polynomial operations, the QAP form constructed by it contains a large number of hash operation functions, and the direct calculation of linear combination in the QAP form will consume a lot of computing resources and time. In order to avoid the above situation, it is necessary to convert the polynomial contained in the QAP form to the value at a certain safe random variable RN. At this time, the QAP equation is still valid.

In order for the verification nodes in the Internet to be able to verify the validity of the transaction without knowing the privacy information related to the transaction, such as the transaction parties and the transaction amount, the elliptic curve pair function needs to be used. The conditions for this function are as follows:

$$e(P, Q + R) = e(P, Q) * e(P, R)$$
$$e(P + Q, R) = e(P, R) * e(Q, R)$$

Where P, Q and R are the points on the elliptic curve, in order to verify the QAP equation of the transformation of the trading rules of the Internet chain, we only need to verify:

$$\mathrm{e}(\delta_a \delta_b) = \mathrm{e}(\delta_c G) * \mathrm{e}\left(\delta_{h_i} \delta_z\right)$$

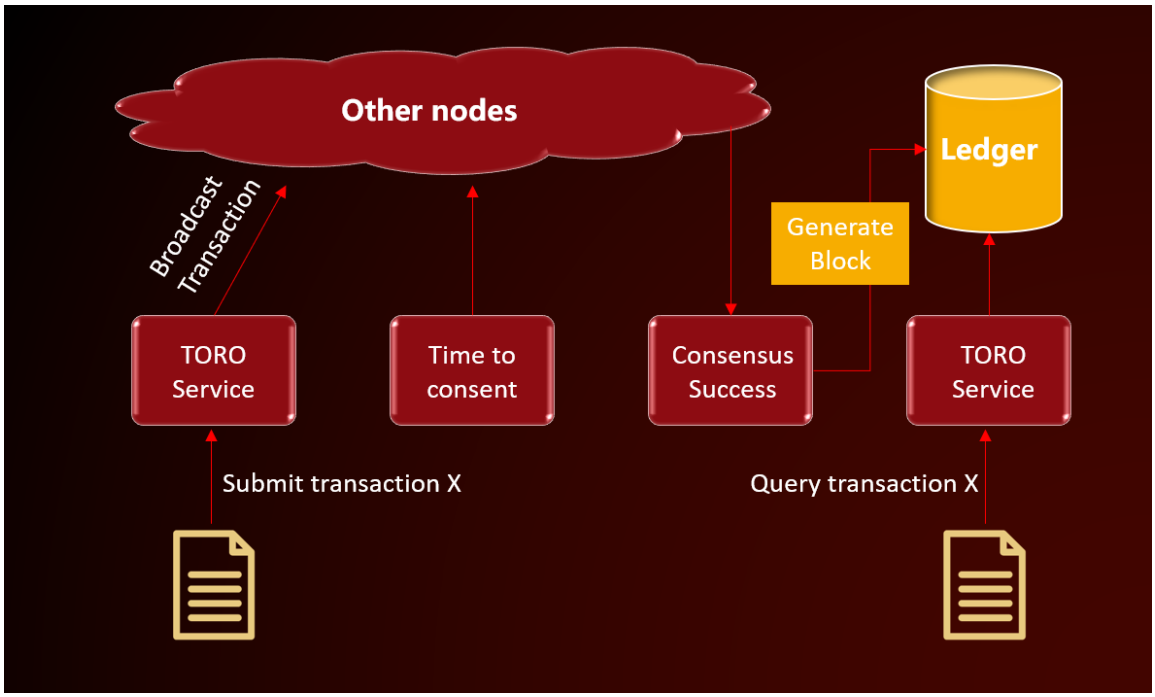
As the carrier of forwarding and verifying cross chain anonymous

transactions, the Internet chain needs to be able to verify the effectiveness of cross chain anonymous transactions. Cross chain transaction can be divided into two types: cross chain transparent transaction and cross chain anonymous transaction. Cross chain transparent transaction provides the content of the transaction itself and relevant Merkle branch evidence. The verification nodes in the Internet can verify the validity of the transaction according to the verification rules of parallel blockchain registration. The cross chain anonymous transaction will not disclose any information except the validity of the transaction. The verification nodes in the Internet need to know the public parameters generated in the start-up phase of each parallel blockchain network, and use these public parameters to verify the validity of cross chain anonymous transactions from the parallel blockchain. The zero knowledge proof algorithm ensures that the verification nodes in the Internet cannot know Any information other than the validity of the cross chain transaction.

4.6 Technical characteristics

4.6.1 Improve transaction speed

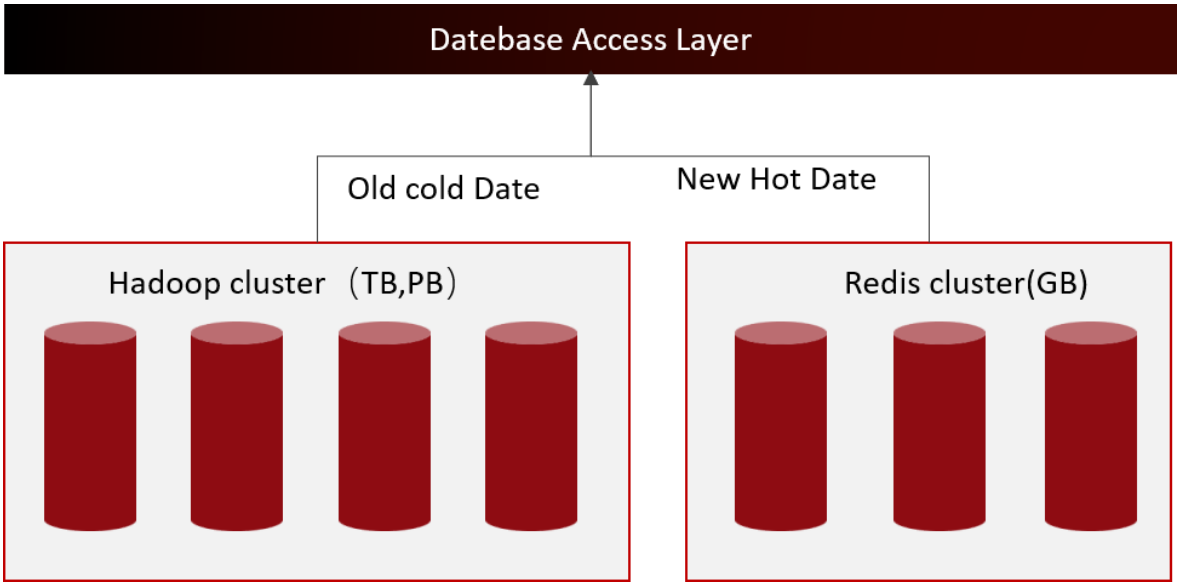
Through the optimization of key links such as signature algorithm, account structure, data operation, serialization, consensus mechanism and message diffusion, TORO chain will realize fast transaction verification in seconds. Meet the user experience of most blockchain application scenarios.



4.6.2 Add data storage

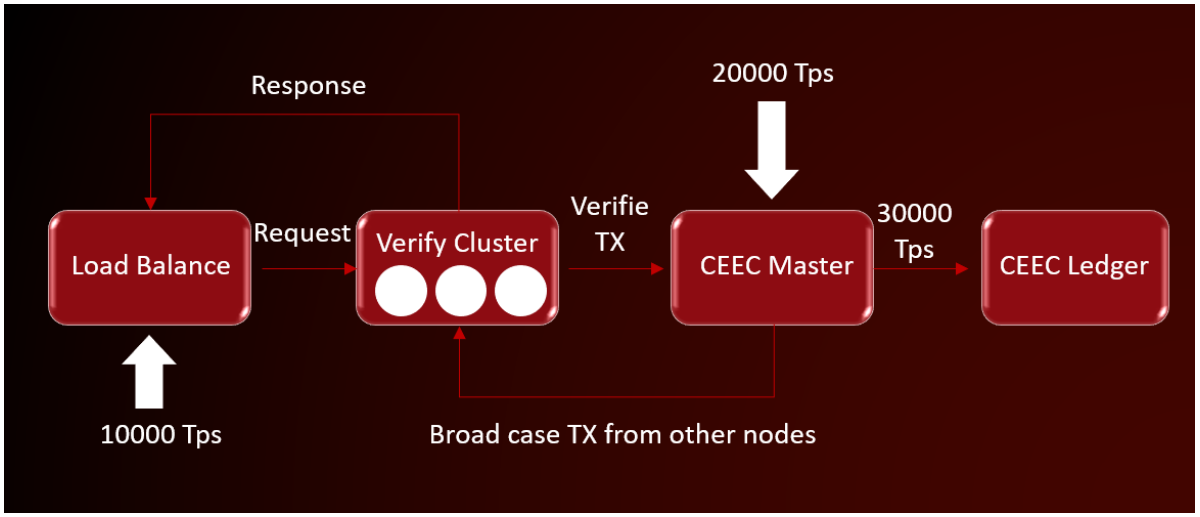
Due to the continuous application of blockchain double entry bookkeeping mode in the system, a large amount of data has been

accumulated, which results in the decrease of operation speed. TORO chain will realize the mechanism of separate storage and separate table storage, and realize the massive storage of data.



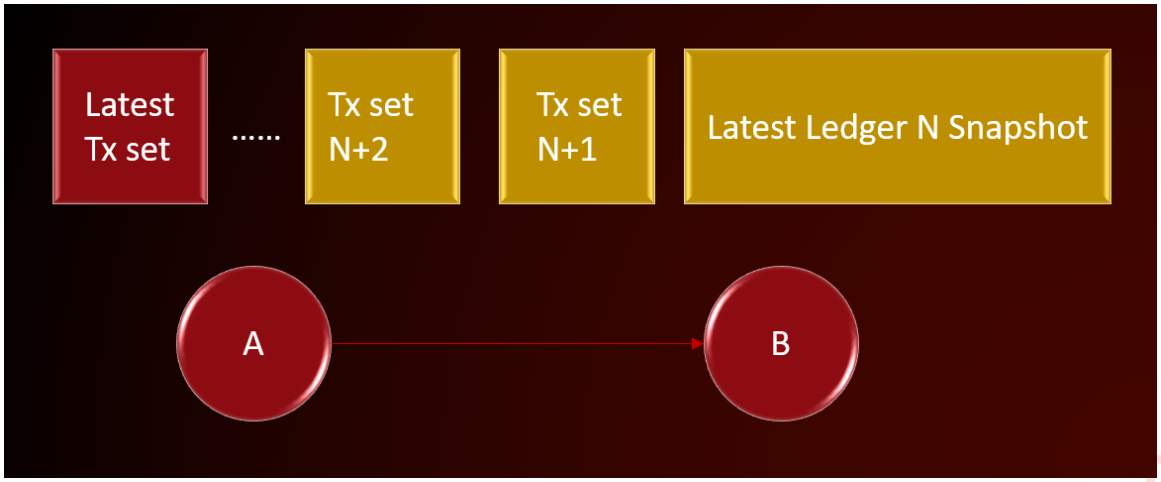
4.6.3 High throughput

The essence of blockchain is a distributed shared accounting technology. Its distributed characteristics are mainly reflected in distributed consistency rather than distributed concurrent processing. In order to ensure the consistency of data and prevent the Byzantine general problem, some specific links can only be executed serially, but not in parallel. Through long-term test and optimization practice, the processing ability of TORO chain will further improve the transaction throughput.



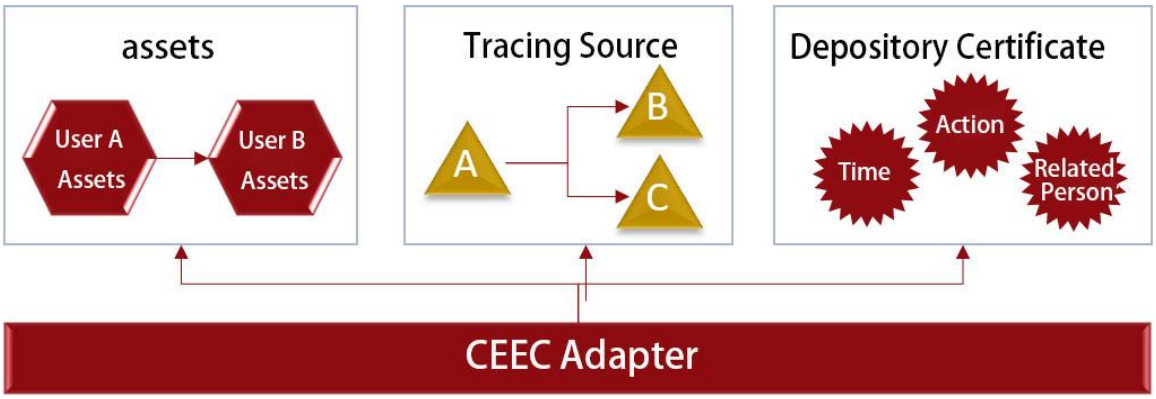
4.6.4 Fast synchronization of node data

TORO chain will develop an image mechanism, which can make images of local ledgers on a regular basis to realize a convenient rollback mechanism. Under a unified consensus, image labels can be specified for rollback. At the same time, it can shorten the period of adding new nodes to join the operation, and only synchronize the latest image and a small number of recent transaction sets can be integrated into the network and participate in consensus verification.



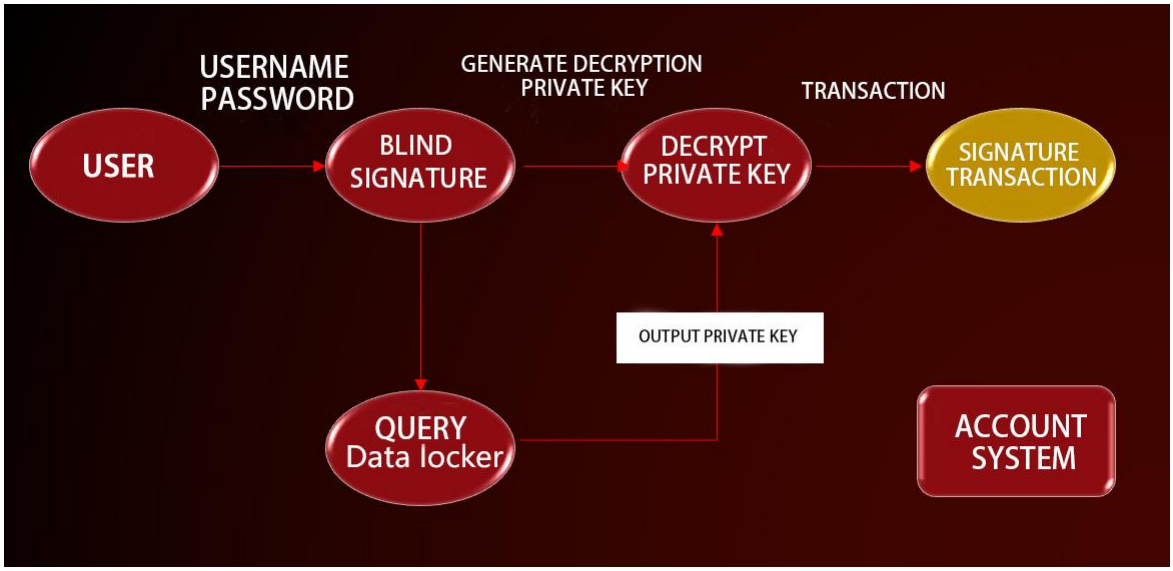
4.6.5 Strong scalability

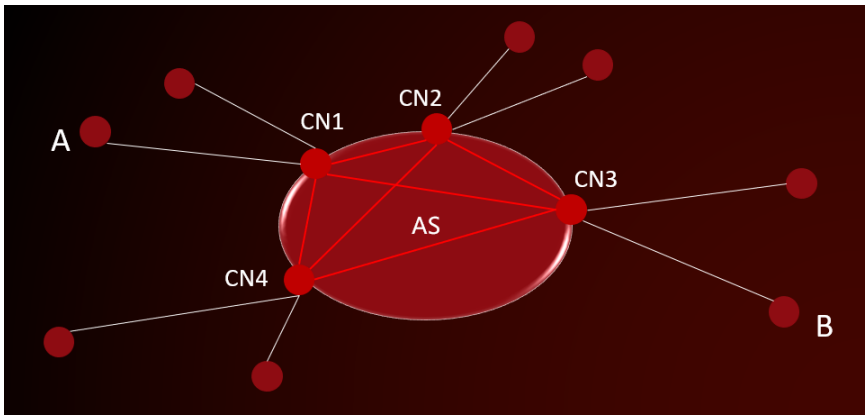
TORO chain's blockchain structure can meet the needs of different business areas and improve the system's scalability and maintenance efficiency. It can be used to mark assets and asset transfers, provide multi-dimensional event records that cannot be tampered with, and trace the source to track the circulation process of goods.



4.6.6 Multiple safety protection

In order to facilitate users to use the product services of TORO chain, in addition to the traditional mechanism of client generation and saving, TORO chain also provides two schemes: network managed access and U-Key hardware access. Network managed access, that is, the user name and password are mapped into a private key through a specific algorithm and stored in the server. The private keys stored on the server side are encrypted data, which can only be decrypted on the client side; the hardware private keys are used to meet the needs of the financial industry and the Internet of things industry.


USERNAME
PASSWORD
GENERATE DECRYPTION
PRIVATE KEY
TRANSACTION
USER
BLIND
SIGNATURE
DECRYPT
PRIVATE KEY
SIGNATURE
TRANSACTION
OUTPUT PRIVATE KEY
QUERY
Data locker
ACCOUNT
SYSTEM



4.7 Network synchronization scheme

●In the blockchain network, some trust nodes are selected as the core hot spots (credit nodes), others are light nodes (TN terminal nodes), and CN nodes build a blockchain autonomous domain (as: autonomous system)

● CN core hotspots run BSP (block synchronization protocol), build a core circle, the nodes in the core circle form a mesh network, real-time synchronization information, jointly maintain a global blockchain, and the core nodes determine online through handshake

● CN core node can join or exit in real time. The newly joined core node first establishes neighbor relationship with other hotspots and synchronizes to obtain global blockchain. After synchronization, it can accept the association request of light nodes

● TN node obtains the list of core nodes through DNS. For the first time, it attempts to communicate with several core nodes in real time through the algorithm, establishes a list of hotspot nodes according to the

communication delay, and establishes a neighbor relationship with the first priority hotspot. If it fails, it will be analogized in turn. If the contact with CN hotspot is interrupted, the next CN hotspot will be found immediately.

4.8 Principle analysis of TORO mining technology

4.8.1 Technical details

(1) Data structure

In the TORO network, when a node initiates a transaction or sends a message, it first creates a new data block and broadcasts it to the peer node, which is called "unit". A cell can contain multiple messages of different types, including the following:

Header: the hash value of the previous cell (parent cell) referenced by the current cell.

Message group: a unit can contain multiple messages. There are many different types of messages. Each message has its own data structure definition.

Signature: for the digital signature of one or more users of the created unit, a single user can have multiple addresses, which are generated by bip-0044 algorithm.

(2) Improve ledger structure

There are some projects on the market trying to implement smart contracts with DAG, but there are few high-level declarative smart

contracts. The improvement direction of TORO's ledger structure is to construct equivalence classes, and to reduce multiple globally ordered linear ledgers into a non-linear ledger that only records partial partial partial partial order relations. This non-linear ledger structure is a DAG. At present, byteball, iota and other projects have realized the function of crypto currency based on the ledger structure of DAG.

(3) Improve system status

TORO's main idea to improve the system state is to localize the global state of the world. Each node no longer cares about all transactions and state transitions, but only maintains a subset of the whole state machine. In this way, the potential of set s and set t are greatly reduced, thus improving the system scalability. Such systems include: Cosmos, aelf, etc.

(4) Improved hash algorithm

In the early stage of TORO, blake2b was used as the unique hash function in the system. With the latest development of ASIC technology, blake2b was gradually replaced by the cryptometric algorithm of ASIC resistant, which was also used by monero. Cryptonight algorithm uses pseudo-random memory to read and write, so it is not compatible with the standard ASIC architecture, but the performance difference between CPU and GPU is relatively less obvious. In the future, in order to prevent the centralization of mining resources, we plan to follow the example set by

monero and adjust the hash algorithm regularly to maintain ASIC resistance during mining.

4.8.2 Consensu and mining

(1) Consensus mechanism

An important feature of workload proof is "memory difficulty". Legal workload proof not only needs a lot of calculation, but also needs a lot of memory. Today, there are two main "memory difficulty" function categories - scrypt And prime coin mining, but both are not perfect; there is no memory required by an ideal memory difficult function, both of them will suffer time memory replacement attack, in which the attacker can complete the legitimate workload proof at the cost of sacrificing some computing efficiency and far less than the memory size required by the algorithm.

In TORO architecture, POC (proof of capacity) is a better memory solution. According to the algorithm designed by TORO, the person who holds TORO in the whole network can choose the block producer through the node system, and any node can participate in the block production.

(2) Mining overview

In order to make it easier for those who hold TORO in the whole network to participate in the mining and network governance of TORO block, we improved the algorithm and mining equipment, so that miners can use mobile memory to mine. In other words, TORO mining only

needs to provide idle bandwidth resources or computing resources to participate.

After the user's smartphone has installed the TORO mining program, it will automatically configure mining computing power according to the user's mobile phone system, chip type and idle space of the mobile phone. TORO consensus mechanism uses a very unique hash algorithm to transfer the difficulty of obtaining "problem solving results" from the chip's operation speed to capacity storage. Because of this, TORO mining does not need much computing power, because it only performs file or data storage / extraction operations, so the more algorithms stored in the miner's local hard disk, the more likely it is to calculate the results faster and get the corresponding block rewards.

Mobile mining does not require too much hardware, so the loss is lower than the hard disk of storage server. Very gentle mining, very friendly to hardware maintenance, unlike ASIC mining for hardware crushing high load operation to reduce life, similar to bulb level power consumption.

It has the following characteristics:

I / O is not sensitive, and the speed of reading and writing to the storage device is not high. This means that there is no need for raid, SSD, or even memory and other more expensive and special storage devices, just a common mobile phone with memory can participate, and the

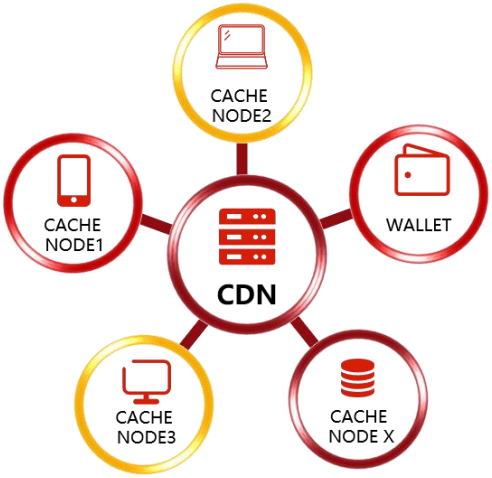
threshold of mining is greatly reduced.

The network bandwidth is not sensitive, the mining search process itself is offline, only when receiving and broadcasting transaction blocks, the network is needed. This means that there is no need to use a large amount of highly centralized resources such as network bandwidth.

Computing resources are not sensitive. Once the data needed for mining is generated, there is almost no need for computing resources to participate in the actual mining process. This means that mining no longer needs a powerful CPU, GPU, and consumes a lot of energy. Even the light computing resource of mobile phone can realize mining.

(3) Mining reward

TORO mining obtains TORO rewards by contributing idle storage space, computing power, reading and writing ability and other resources of mobile phones. TORO's mining process is planned to last for quite a long time. The total currency of TORO is 840 million. More than 90% of TORO will be used for mining.



Mining rewards are divided into fixed income and floating income. Fixed income can be obtained if basic mining conditions are met. Floating income is distributed according to the quality of mobile memory contributed by users.

TORO has customized a perfect eco-economic cycle model to ensure the health of the whole system, the real existence and stable growth of ecological needs, the dependence of users and nodes on it will gradually increase, and the value of the whole project will naturally show.

4.8.3 Working principle

TORO is an intelligent CDN node deployment software based on the open-source squid, combined with SDK and P2P technology. It gives full play to the multiple advantages of P2P and traditional CDN intelligent node scheduling and SDK to realize data serial to parallel, single path to multi-channel, algorithm and protocol can be continuously optimized for a long time, and 100% anti-theft chain anti hijacking. Easily upgrade smart devices to CDN nodes. TORO team fully grasps and makes use of the core technical advantages of distributed CDN, intelligent scheduling, layered release and dynamic deployment, and dynamic defense against DDoS. It has effectively realized the acceleration services in the hot areas of Internet, such as game download, mobile application, video on demand, intelligent hardware and online live broadcast.

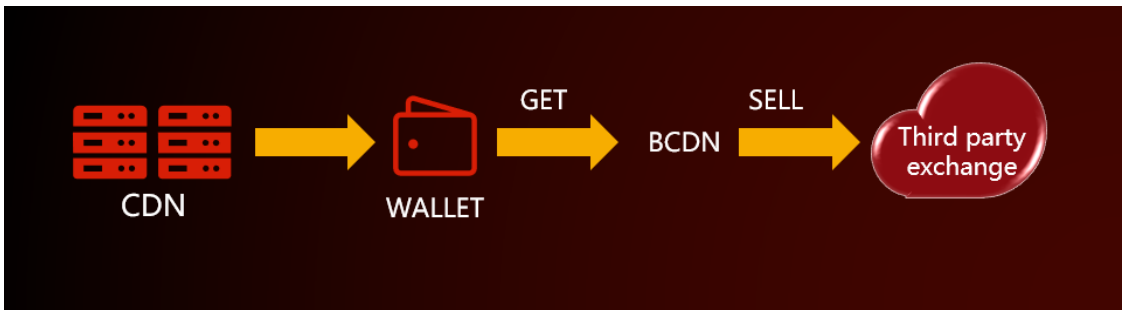
DAPP: mobile mining software, which contributes mobile memory

through DAPP, participates in TORO mining and obtains tokens (TORO). At the same time, using DAPP to buy more memory can speed up mining. You can speed up the website, speed up traffic size and traffic unit price with one click.

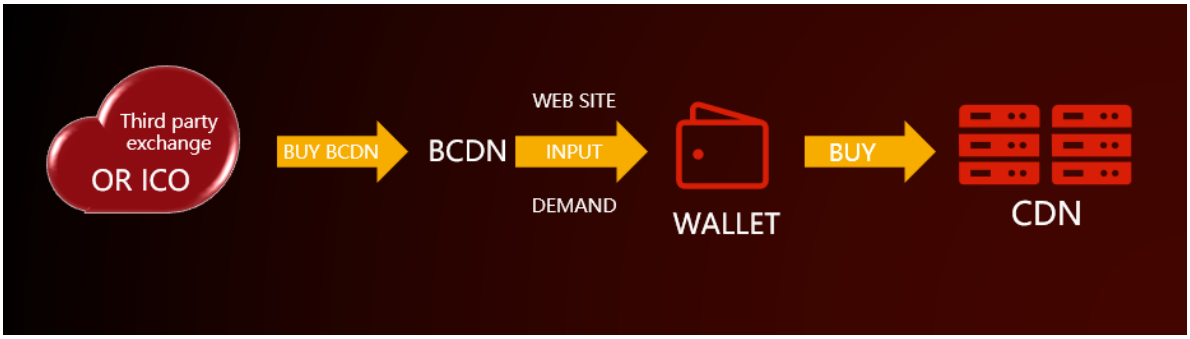
Demander: purchase the CDN service you need through DAPP.

Sharer: through the idle mobile memory (PC, routing, TV box, TORO mining treasure may be launched in the future), it can become a CDN cache node and provide distributed acceleration for the website, and obtain the corresponding TORO license according to the upload traffic.

Trading platform: users can purchase and sell TORO through the trading platform. Here is the TORO accelerated procurement process:



Users can obtain TORO through transaction and save it in TORO DAPP. The website owners who need to speed up only need to input the domain name, traffic and payment quantity of TORO into the TORO platform. The following is TORO acquisition, transaction process:



The node sharer obtains the token TORO according to the blockchain smart contract by uploading the accelerated traffic, and he can save the TORO in his wallet. It can also be sold to customers who need CDN on the third-party trading platform. The records involved in the interaction of all data can be checked at any time in the blockchain, which is absolutely fair, just and anti modification.

Chapter 5 - TORO economic model

5.1 Introduction to TORO

TORO token is a built-in native encrypted digital token of TORO network, which can be used for transaction, settlement and smart contract performance on the chain. TORO token can easily represent and measure the digital economic activities on TORO network. Its value is based on two points: first, the application of TORO chain needs to consume a certain amount of TORO token as fuel; second, the holder of TORO token can participate in the community governance of TORO blockchain.

TORO public chain generates one block every 5.6 seconds, each block contains 12 TOROes. TORO, as an important link to maintain the operation of the ecosystem in the TORO chain, is the guarantee to form a large ecosystem closed-loop, bearing the important role of value circulation, purchase services, obtain returns and encourage interaction.

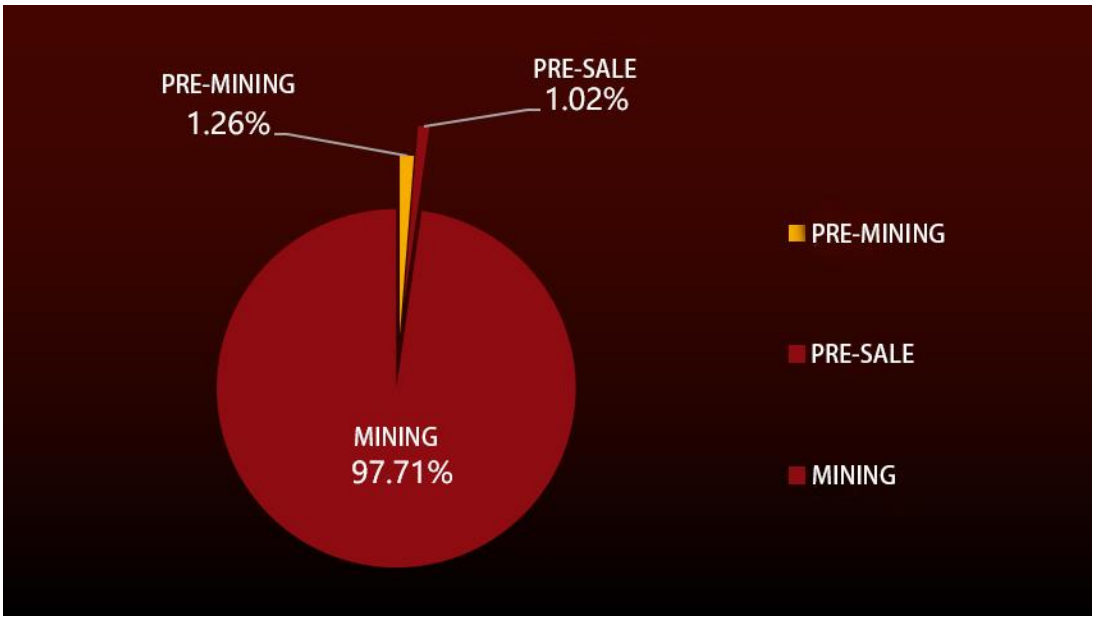
Before the main network of TORO network is officially launched, erc20 token based on Ethereum will be issued as the token of data sharing basic public chain. We have customized a complete set of commercial ecological landing system around it, following the principles of safety, transparency, reliability, modularity, parallel expansion, etc., to provide

corresponding intelligent equipment incentive scheme. TORO, as the value basis of the ecosystem, is the standard value unit of all costs and value exchange, which passes through all links of the system.

5.2 Issuance mechanism

The total number of TOROes is 840 million, with 10.6 million pieces of pre excavation (8.6 million of which are used for pre exchange, divided into three phases; 2 million for ecological construction), 8.6 million private placement, and the remaining 820.8 million TOROs for mining.

NAME	AMOUNT	RATIO	NOTES
Pre-mining	1060	1.26%	8.6 million for early exchange (in three phases), 2 million for ecological construction
Pre-sale	860	1.02%	
Mining	82080	97.72%	



5.3 Circular economy

Users can purchase mobile memory to participate in mining and get TORO rewards. They can get TORO by contributing idle mobile storage space, device computing power, hard disk read-write ability and device stability multi-dimensional scoring algorithm. TORO will charge 10 TOROes from each transfer in the chain as a handling fee.

The supplier in the eco economic cycle of TORO refers to the workers who facilitate the smooth operation of the main network. They participate in the governance and mining of the main network by purchasing mobile phones to mine as the elected node of the mining machine. After that, they can choose to sell or retain the TORO to the exchange, and the TORO sold to the exchange will have the opportunity to be purchased by

consumers in the future to form a complete economy Cycle.

5.4 Certificate destruction mechanism

5.4.1 Private placement phase destruction

If the previous exchange is less than 6 million, the private placement of the project will be declared to be failed;

If the amount of 860 ≥ private placement ≥ 6 million, the certificates that have not been private placement will be destroyed.

5.4.2 Destruction in currency production stage

If the daily production of currency in the early stage is greater than the actual mining volume, all the excess certificates shall be destroyed;

If the daily production of currency is less than the actual mining volume, it will be distributed according to the actual production.

Chapter 6 - Ecological construction and implementation route

6.1 Ecological construction

A great ecosystem can not be separated from a great vision, a great community can not be separated from its great consensus. The TORO bull sharing economic network we created is confident to let this experimental moment influence the blockchain world.

TORO main network will create the whole sharing economy landing ecology around "mobile mining". The operation of the main network needs the support of mobile memory mining equipment. Mobile memory mining is not only a common intelligent terminal, but also the private cloud of the family, as well as the maintenance node and public chain mining machine of TORO cloud. TORO expects to bring the concept of idle resource sharing of cloud services based on mobile mining and the intelligent Internet of things terminals into thousands of households in the future, so that people can fully enjoy the real sharing economy and the convenience and practicality of everything interconnection.

In order to achieve the goal and achieve the vision, TORO ecological construction has made a very careful long-term plan:

6.1.1 Goal 1: the number of nodes exceeds one million

TORO's ultimate change to the global network is to realize the real sharing economy and the interconnection of all things, build a data sharing space beyond the centralized Internet, and hope to promote the transplantation of the centralized network to the decentralized network, so as to meet the basic needs of all people's data sharing. When the number of nodes in the TORO ecosystem exceeds 1 million, it will provide a free and stable network environment for the entire TORO free network, lead all people to experience the real sharing economy, and experience the convenience and practicality of the interconnection of all things.

6.1.2 Goal 2: connect with multiple global legal currencies

As the lifeline of cryptocurrency economy, cash flow plays a key role in the ecological growth of the whole project. The more abundant cash flow flows into the economy, the stronger the value driving force in the project ecology. Similarly, the more types of legal currencies the bee connects with, the more cash flow channels will be formed, which can provide sufficient currency exchange and circulation basis for the project day, and the larger the volume of capital flowing into the economy. As the world's largest third-party payment platform, PayPal was able to connect with more than 20 legal currencies around the world. We believe that when the

number of legal currencies exchanged by bee is the same as that of PayPal, bee will become the best channel for global currency circulation and support the business ecology of TORO.

6.1.3 Goal 3: Ecological Application exceeding 300, affecting more than 20 industries

In addition to changing the centralized business pattern, DAPP and its developers in TORO ecosystem are fully capable of changing the operation mode of more fields in the world. Up to now, the number of effective dapps in Ethereum is 19, with a total market value of US $1.8 billion, but it has not really formed an impact. TORO will not only surpass the number of dapps, but also double the total market value of all dapps of Ethereum, with a total market value of more than $3.6 billion. At the same time, it will benefit from the recycling effect of the whole ecology. These dapps will also have a profound impact on more than 20 industries and fields, including insurance, health, energy, catering, service, media, education, manufacturing and public welfare.

TORO's decentralized design is a high degree of respect for all human ideas. Blockchain emphasizes "consensus", and the premise of "consensus" is to gather more people with the same idea, so TORO needs more participants to jointly build a more perfect TORO ecology. One day,

we will create a new world.

6.2 Route

October 2019: TORO foundation was established, aiming to get through the real shared economic ecology of TORO.

November 2019: The core team components are completed, the underlying technical architecture is determined, and the early preparations are started. In January 2020, in-depth research and development of core code, docking with the factory mobile mining production.

March 2020: Prepare the publicity and distribution materials of TORO project, complete the research and development of mobile mining software, and enter the pre excavation stage.

April 2020: White paper was released to officially open mobile mining.

May 2020: TORO digital bank launch.

May 2020: TORO launch wallets and goes online to several exchanges.

June 2020: TORO blockchain red packet goes online to ignite the market.

July 2020: The development of instant messaging system is completed. While chatting through TORO, anonymous, TORO transfer, red packet sending and receiving can be realized.

August 2020: Connect with the blockchain mall and start a new payment scenario of TORO.

September 2020: the main network and hardware mining tools will continue to be updated, and the PC mining software will be launched.

October 2020: "Blockchain+VR" game – Roma Emperor

November 2020: The first stage of main chain R & D is basically formed, and it enters the internal test stage.

December 2020: Recruitment node of the whole network

January 2021: Release the public chain test network to the outside world, prepare for node deployment, and start to expand the ecology.

February 2021: The short video application of TORO blockchain went online.

April 2021: The main network was officially launched, the deployment of ecological nodes was completed, and the TORO was officially launched.

July 2021: Launch TORO mining treasure hardware equipment and open a new era of private cloud.

September 2021: Launch the software application matched with mining treasure to realize the integrated management of multiple TORO software.

October 2020: Release TORO application mall

January 2022: The overall business ecology takes shape, the surrounding

ecological deployment is opened, and the landing of TORO public chain incubator is accelerated.

Chapter 7 - About us

7.1 overview of TORO Foundation

TORO Foundation Ltd. was founded in Singapore as a non-profit company complying with local laws and regulations. The foundation is committed to the development and research of the underlying technology, intelligent equipment, Internet of things, business ecological construction, etc. of TORO blockchain, as well as urging the team members to gradually realize the global business ecological landing according to the roadmap after the issuance.

7.2 Foundation structure and main work

The organizational structure of the foundation is mainly composed of decision-making committee, finance and Market Committee and Public Relations Committee. They are respectively responsible for the research and formulation of long-term planning, the formulation of articles of association and management system, and the feasibility study and approval of new projects. Manage daily operation; research and develop risk control strategies, develop risk control standards, review overall operation risks, convene project risk review meetings and organize the

release of review results; draw up and modify compensation and incentive plans, review organization settings and post settings, and hire personnel; in addition, the foundation is also responsible for operation audit, financial audit, code audit and token Destruction, etc.

As for the issuance, distribution, smart contract code and other related materials as well as financial reports, the foundation selects large accounting firms, conducts annual audit and publishes the audit report on the website.

TORO foundation vigorously develops the application business of blockchain technology, and its core team is mostly outstanding talents from business and finance colleges all over the world. The goal of global SME fund is to aim at the huge fund management market in the world. It aims to help the world's top institutional funds to realize the innovation

model of Finance + blockchain technology + big data processing + application entity industry by utilizing the long-standing reserves of big data and blockchain technology.

The foundation will practice democratic and transparent governance principles, promote the development, construction and development of TORO network, manage relevant matters of open source community projects, and promote the harmonious development of open source community by formulating a good governance structure.

The organizational structure of the foundation will be composed of board of directors and work group, which are responsible for administration, technology, operation, management and other functions, handling daily work and special matters, jointly maintaining the pace of daily operation and ensuring the pace of development.

The board of directors is the highest management and decision-making body of the foundation. The board of directors is composed of more than three directors and has a president, who is elected by the members of the board. The Council is responsible for the management and leadership of all affairs of the foundation. Its functions include the appointment or dismissal of the chief executive officer, making important decisions,

holding emergency meetings, etc. All the following matters shall be voted by the Council by open ballot, and each member of the Council shall have one vote. A resolution of the Council must be adopted by a majority of all the members of the Council in office. The Council performs the following functions:

(1) Modify the governance structure of the foundation;

(2) To decide on the appointment or dismissal of the chief executive officer;

(3) Make important technical path, business model, market direction and other decisions;

(4) Emergency events, such as events affecting the whole community, software security, system upgrade, etc;

(5) Other major decisions.

7.3 Community

The foundation can set up multiple working groups according to the needs, which are responsible for different affairs management, including technical, operation, management, project and other working groups as follows:

(1) Technical Working Group

The technical working group is composed of the core developers in TORO network development team, responsible for the decision-making,

technical development and review of the R & D direction. In addition, members of the technical working group deeply understand the trends and hot spots of the community and industry, communicate with participants in the community, and hold technical exchange meetings from time to time.

(2) Operation working group

The goal of the operation working group is to serve the community and be responsible for the promotion of TORO network technology, marketing, application publicity, etc. The operation working group is responsible for press conference, public announcement of important matters, inquiry and answer, etc. In the event of an event affecting the reputation of the foundation, the operations working group will issue an authorized response as a unified channel.

(3) Management team

The management working group is responsible for the personnel management, salary distribution and other administrative affairs of the foundation. The foundation will recruit excellent management and technical talents as full-time or part-time staff of the foundation. The foundation will also employ famous people in various industries as consultants. All hiring and compensation decisions need to be agreed by more than two members of the board of directors and signed by the chairman of the foundation.

(4) Project team

The project working group is responsible for the design of the project scheme, the realization of network operation and application landing, and the optimization and adjustment of relevant community functions according to the application of the project to ensure the healthy development of the network. In terms of community construction, applied ecology, cutting-edge science and technology research and other projects, the project team is responsible for the establishment and promotion of the project.

(5) Asset working group

The foundation adopts multiple signatures or other technical means to ensure the security and accuracy of the assets. Based on the principle of openness and transparency, the use of crypto assets will be supervised by the asset working group.

7.4 Governance on Chain

The holder of TORO is the chain owner and manager of TORO network. The right of management is realized by constructing voting transaction on TORO network, and the right of use is realized by transaction on TORO network or fuel cost in smart contract.

Because transactions or smart contracts initiated by users will occupy the

resources of blockchain network, users need to pay a certain amount of gas as a fee, which is measured by TORO. The parameters related to gas will be saved on the blockchain, and a set of gas adjustment algorithm will be used by the community to vote for new gas parameters according to the current network development.

Chapter 8 - Legal Affairs and risk statement

8.1 Legal Structure

As an independent legal entity, TORO foundation will be fully responsible for organizing teams to develop, promote and operate TORO network projects.

TORO foundation will accept donations or private placements to specific groups of people in a proper way in strict accordance with local laws and regulations, and give them to TORO. TORO will not conduct public crowdfunding or public fundraising in some countries and regions due to the restrictions of national citizens or groups. TORO, as a virtual commodity with practical use, is neither a security nor a speculative investment tool.

The income of TORO foundation will be mainly used for technology development, community construction, marketing, business cooperation,

financial audit and other purposes.

TORO network is still likely to be questioned and supervised by competent authorities in different countries around the world. In order to meet and comply with local laws and regulations, TORO network may not be able to provide normal services in some areas.

8.2 Risks

Except as expressly stated in this white paper, the TORO foundation makes no representations or warranties (especially with respect to its merchantability and specific functions) with respect to the TORO network or TORO. Anyone participating in the donation / sale plan and purchase of TORO is based on their own knowledge of TORO network and TORO network token, laws and regulations as well as the information in this white paper. Without prejudice to the generality of the foregoing, all participants will accept TORO as it is after the start of TORO network project.

The objectives and contents listed in this white paper may change, and some contents of the document may be adjusted in the new white paper or other documents as the project progresses. The team will publish the updated contents to the public by publishing announcements or updating the white paper or other documents on the website.

TORO foundation hereby expressly disclaims and disclaims the

following responsibilities:

(1) Any person who violates the anti money laundering, anti terrorist financing or other regulatory requirements of any country when purchasing TORO;

(2) Any person who violates any representation, warranty, obligation, commitment or other requirement set forth in this white paper when purchasing TORO, and the resulting inability to use or extract TORO;

(3) For any reason, TORO's sale plan is abandoned;

(4) The development of TORO network fails or is abandoned, and the resulting failure to deliver or use TORO;

(5) The delay or postponement of TORO network development, and the resulting failure to reach the schedule for prior disclosure;

(6) Errors, flaws, defects or other problems of TORO network and its TORO source code;

(7) TORO network, failure, breakdown, paralysis, rollback or hard fork of TORO;

(8) TORO network or TORO fails to achieve any specific function or is not suitable for any specific purpose;

(9) Use of funds raised by the TORO sale plan;

(10) Any participant divulges, loses or destroys the wallet private key of TORO;

(11) Breach, violation, infringement, collapse, paralysis, termination

or suspension of services, fraud, misoperation, misconduct, error, negligence, bankruptcy, liquidation, dissolution or winding up of TORO's third party distribution platform;

(12) There are differences, conflicts or contradictions between the agreed content between anyone and the third-party distribution platform and the content of this white paper;

(13) Any person's trading or speculation in TORO;

(14) Listing, suspension or delisting of TORO on any trading platform;

(15) TORO is classified or regarded as a currency, security, commercial paper, negotiable instrument, investment product or other thing by any government, quasi government agency, competent authority or public institution, so that it is prohibited, regulated or restricted by law;

(16) Any risk factors disclosed in this white paper, and any damages, losses, claims, liabilities, penalties, costs or other adverse effects resulting from or incidental to such risk factors.

In addition, there are risks that have not been mentioned or anticipated by the TORO foundation and team. To the maximum extent permitted by applicable law, TORO foundation and the team shall not be liable for damages and risks arising from participation, including but not limited to direct or indirect personal damages, loss of business profits, loss of

business information or other economic losses. Please fully understand the team background, the overall framework and ideas of the project and participate rationally before the participants make the decision.

Terminology explanation

(1) **Blockchain**: blockchain is an important concept of bitcoin. In essence, it is a decentralized database. As the underlying technology of bitcoin, it is a series of data blocks generated by using cryptography methods. Each data block contains all the information of bitcoin network transactions, which is used to verify the effectiveness (anti-counterfeiting) and Generate the next block.

(2) **Public blockchain**: As the most common category in blockchain, any individual or collective in the world can use it to send transactions, and the transactions can obtain effective confirmation of the blockchain, and anyone can participate in its consensus process. In addition to the public basic chain, there are two types of blockchain: private chain and alliance chain. Public blockchain is the earliest blockchain, and it is also the most widely used blockchain at present. All the major digital currencies appearing on the market are based on public blockchain, and the blockchain industry is called public chain for short.

(3) **CDN**: CDN, content delivery network, translated from Chinese into content distribution network. CDN is an intelligent virtual network built on the basis of the existing network. Depending on the edge servers deployed in various places, through the load balancing, content distribution, scheduling and other functional modules of the central platform, users can get the required content nearby, reduce network

congestion, and improve the user access response speed and hit rate. The key technologies of CDN mainly include content storage and distribution.

(4) **Smart contract**: smart contract is a computer protocol designed to spread, verify or execute contracts in an information-based way. Smart contracts allow for trusted transactions without a third party, which are traceable and irreversible. The purpose of smart contracts is to provide better security methods than traditional contracts and reduce other transaction costs related to contracts.

(5) **Crypto currency Mining**: bitcoin mining is essentially a process of decoding to confirm bitcoin transactions, and the first machine to crack will be rewarded with bitcoin. Because this is similar to the process of mining gold from gold mines, the industry uses the word "mining" as an image metaphor.

In the blockchain industry, "mine" refers to the crypto currency running on the blockchain, "mining" refers to the process of obtaining crypto currency as reward through problem-solving competition, while "miner" refers to the machine that uses mining equipment (crypto currency miner such as bitcoin) to participate in mining, "miner" refers to the person who controls these miners, "mine" refers to the physical concentration of these miners The "mining pool" is a place where part of the crypto currency computing power is combined and then the mining is divided into two parts (mainly websites).

(6) **Node**: a node is a network node in a blockchain distributed system. It is a server, computer, telephone, etc. connected through the network. For different blockchains, the way to become a node will be different. Taking bitcoin as an example, participating in transactions or mining constitutes a node.

(7) **DAG**: the full name of DAG is directed acyclic graph, that is, directed acyclic graph. Directed acyclic graph refers to a directed graph without loop. If there is a undirected acyclic graph, and the starting direction B of point a returns to a through C, forming a ring. If we change the direction of the edge from C to a to a to C, then it becomes a directed acyclic graph. The number of spanning trees of a directed acyclic graph is equal to the input product of nodes with non-zero degree.

(8) **Edge computing**: originated in the field of media, edge computing refers to an open platform integrating network, computing, storage and application core capabilities on the side close to the source of objects or data, which provides the nearest service nearby. Its applications are launched on the edge side, which can generate faster network service response and meet the industry's basic needs in real-time business, application intelligence, security and privacy protection. Edge computing is between a physical entity and an industrial connection, or at the top of a physical entity. However, cloud computing can still access the historical data of edge computing.

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White list of Exchanges

NAME	DOMAIN NAME
KuCoin	https://www.kucoin.com
MXC	https://www.mxc.com
OKEx	https://www.okex.com
ZB.COM	https://www.zb.com/
ZBG	https://www.zbg.com/
ZG.com	https://www.zg.com/
FCoin	https://www.fcoin.com/
gate.io	https://gateio.news
HitBTC	https://hitbtc.com
Huobi	https://www.huobi.com
LBank	https://www.lbank.info
Liquid	https://www.liquid.com/
FUBT	https://www.fubt.com
OCX	https://www.ocx.app
Upbit	https://upbit.com
VVBTC	https://www.vvbtc.com
WBFEX	https://www.wbfex.com/
ZT.com	https://www.ZT.com
Coinall	https://www.coinall.com/
Coinbase Pro	https://pro.coinbase.com

CoinBene	https://www.coinbene.com
Coinbit	https://www.coinbit.co.kr/
Coineal	https://www.coineal.com
Coinbig	https://www.coinbig.org/
CoinEgg	https://www.coinegg.com/
CoinEx	https://www.coinex.com
coining	https://www.co2ning.com
CoinTiger	https://www.cointiger.com
CoinZest	https://www.coinzest.co.kr
ctopai	https://www.ctopai.country.kr
DragonEX	https://dragonex.io
Dididu	http://www.dididu.com/
eunex	https://www.eunex.co/
bjex	https://bjex.pro
Cnew	https://www.coinnew.io
TTEX	https://www.ttex.com
Korbit	https://www.korbit.co.kr
Kraken	https://www.kraken.com
IDAX	https://www.idax.pro
KEX	https://www.kex.com
58COIN	https://www.58ex.com/
6x	https://www.6x.com
898 Global	https://www.898.io/

AEX	https://www.aex.plus/
aiibit	https://www.aiibit.com
BANK	http://bank.xxx
BCEX	http://bcex.vip
BigONE	https://www.big.one
BiKi	https://www.biki.com
Binance	https://www.binance.com
Bision	https://www.bision.com
Bitfinex	https://www.bitfinex.com
BitForex	https://bitforex.com
Bithumb	https://www.bithumb.com
BitMEX	https://www.bitmex.com
bitsonic	https://www.bitsonic.co.kr
Bit-Z	https://www.bitz.top/
BKEX	https://www.bkex.com/
cashierest	https://www.cashierest.com
CEO	https://ceohk.bi
Coinall	https://www.coinall.com/
Coinbase Pro	https://pro.coinbase.com
CoinBene	https://www.coinbene.com
Coinbit	https://www.coinbit.co.kr/
Coineal	https://www.coineal.com
Coinbig	https://www.coinbig.org/

CoinEgg	https://www.coinegg.com/
CoinEx	https://www.coinex.com
coining	https://www.co2ning.com
CoinTiger	https://www.cointiger.com
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Bit-Z	https://www.bitz.top/
BKEX	https://www.bkex.com/
cashierest	https://www.cashierest.com
CEO	https://ceohk.bi
GGBTC	https://www.ggbtc.com
GOKO	https://www.goko.com
HAOCOIN	https://www.haocoin.com
Hotcoin Global	https://www.hotcoin.top
IDCM	https://www.idcm.cc
IX	https://ix.com
IXX	https://ixx.com
LINKKT	https://linkkt.com
MNEXCOIN	https://www.mnexcoin.com
MYHORSE	https://www.myhorse.vip
QB.COM	https://www.qb.com

REDBI	https://www.redbi.com
ROCKEX	https://Rockex.top
TOKENCAN	https://www.tokencan.net
Tokenpark	https://www.tokenpark.co
TOP.ONE	https://www.top.one
UBcoin	https://ubcoin.io
U-COIN	https://www.ucoin.pw
YOOEX	https://Yooex.io
ZG.top	https://www.zg.top
ZGK	https://www.zgk.com
ZHUIBI	https://www.zhuibi.com
ZZEX	https://www.zzex.me

In order to promote ecological development and improve the enthusiasm of ecological members, TORO ecological foundation has decided that all ecological members will be rewarded with 30000-100000 TORO if they successfully connect with the above exchanges.

Disclaimer

As a new investment mode, crypto asset investment has different risks. Potential investors need to carefully evaluate the investment risks and their own risk tolerance.

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This document does not constitute or understand to provide any trading behavior or any invitation to buy or sell any form of securities, nor is it any form of contract or commitment.

Relevant interested users clearly understand the risk of TORO. Once investors participate in the investment, they will understand and accept the risk of the project, and are willing to bear all the corresponding results or consequences.

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