META GATE PLATFORM

Dual-chain decentralized application development platform

META GATE TEAM

2023

I. Abstract

Meta Gate Platform (MTGT) is a decentralized blockchain ecosystem platform targeting the global market. MTGT is dedicated to deeply integrating blockchain technology with the real economy and building the most user-friendly enterprise-level blockchain application platform.

MTGT adopts an innovative "multi-chain" architecture design, which to some extent improves the scalability, intelligence, and security of decentralized systems. With its unique MPBFT consensus algorithm at the core, MTGT supports multiple smart contract programming languages, balancing ecosystem development and technological innovation.

The MTGT team focuses on providing new Internet value to users, empowering enterprises to improve production and operation methods with blockchain technology, and providing more diverse and credible products and services to emerging consumers. For this purpose, MTGT will build a wealth of application scenarios and is committed to establishing a rich decentralized application ecosystem covering NFT, DeFi, intelligent insurance, and other commercial fields, which helps to attract more developers and users to participate.

The promotion of MTGT will significantly lower the threshold for enterprises to apply blockchain technology. Through the unique functions of MTGT, business model upgrades and evolution can be realized, enabling the long-term stability and rapid development of the entire MTGT ecosystem.

II. Project Background

The birth of Bitcoin sparked research and business exploration of blockchain technology and decentralized thinking around the world. Ethereum's birth provided smart contracts on this basis, allowing truly decentralized applications to be realized, including: using on-chain digital assets to represent customized currencies, financial instruments, Internet behavior traceability tools, data rights confirmation and data value tokens, non-fungible digital assets, etc. More complex applications based on blockchain technology, such as finance, games, dating, e-commerce, etc. Over the years, decentralized applications have proven their value in technology fields and have been widely

recognized in business fields. However, due to the following reasons, the development of this advanced technology for large-scale commercial transformation has been restricted:

- Lack of unified standards. Internet teams working individually, forming a series of information islands with low information circulation efficiency and significant challenges in cross-application information exchange and settlement.

- Low efficiency. In the current Web3.0 ecosystem, all communication between applications still relies on the centralized infrastructure and cloud servers of the Web2.0 era for verification, connection and processing. This kind of infrastructure cannot support the large-scale decentralized applications in Web3.0, limiting the potential of Web3.0.

- Security risks. Centralized networks have extremely high security requirements for central servers. Security vulnerabilities in central servers will affect all nodes in the entire network.

- High cost. The decentralized technology model leads to high infrastructure operation and maintenance costs for individual applications. When the number of commercial applications increases to tens of thousands or even hundreds of thousands, it will generate a large amount of information data, making commercial solutions very expensive.

In summary, decentralized applications currently face multiple challenges, such as lack of unified standards, low efficiency, security risks and high costs. To achieve large-scale decentralized commercial applications and commercial applications in the Web3.0 environment, it is necessary to establish open unified standards, improve network efficiency and reliability, optimize cost structure, build an application ecosystem, and strengthen risk management. Only through technological innovation and business model exploration can we build an efficient, secure and low-cost decentralized information network, so that decentralized commercial applications have the opportunity to truly achieve and thrive.

III. Project Objectives

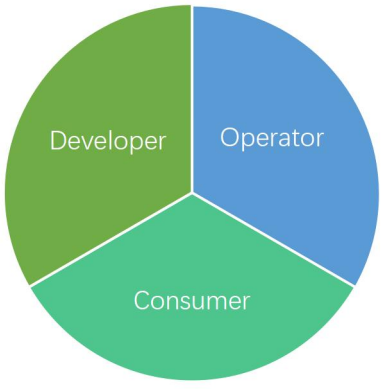
Build the most user-friendly enterprise-level blockchain application platform. By applying blockchain technology, establish a unified standard, secure, efficient and diverse multi-chain architecture, decentralized and trustworthy enterprise-level blockchain application platform.

IV. Project Introduction

1. MTGT is a decentralized blockchain application platform driven by business

MTGT is a blockchain platform for the Web 3.0 era driven by commercial applications. MTGT targets three user groups: developers, operators, and consumers. We provide developers with a flexible and friendly development environment, supporting smart contract writing in multiple languages (Solidity, C++, Java, Python, JavaScript), with execution efficiency improved several times compared to traditional chain platforms. We allow operators to obtain MTGT token incentives by contributing network resources, including but not limited to computing power, storage, and bandwidth.

Users are the cornerstone of the platform and the users and participants of Dapps. We provide users with simple, convenient and diverse ways to access Web 3.0, while encouraging users to obtain MTGT token incentives through behaviors such as sharing data (network behavior, consumption data), and participating in the construction of the Dapp ecosystem.



Through the integration of blockchain technology and business applications, MTGT motivates users to provide resources and generate value, thereby building a sustainable blockchain ecosystem with a positive cycle.

2. The MTGT structure is a scalable heterogeneous multi-chain network

MTGT is designed as a scalable, heterogeneous network of interconnected blockchains. On this platform, a large number of secure and consistent datasets across chains can be constructed. It can relay different applications to form an edge computing network, effectively circulate network resources, and facilitate widespread business use cases.

The MTGT structure adopts the architecture of "bottom layer chain, parallel chain and sub-chain", connecting different applications to form a distributed cellular network structure. Algorithmic mechanisms ensure trusted interaction between different applications. At the same time, different types of applications can access different parallel chains to avoid the ledger data volume exploding and affecting operating efficiency.

The components of the MTGT network architecture are as follows:

Main chain (Foundation layer chain): The MTGT foundation public chain, which performs system-level functions such as asset circulation, consensus computing power supply, and cross-chain operations.

Parallel chains (Application-specific chains): Chains with different attributes and functions carry different types of decentralized applications, such as financial chains, logistics chains and medical chains. Parallel chains are independent of each other but interact value and information through the foundation public chain.

Sub-chains (Custom chains): Specialized chains built under parallel chains for applications to enhance their scalability and concurrency. Sub-chains can be customized the consensus mechanisms and encryption algorithms required by applications, and interact value and data interoperability with parallel chains through cross-chain technology.

Relay chain: As a bridge between multiple heterogeneous chains, it can realize value transfer and information exchange between different chains. The data structure on the relay chain simplifies cross-chain operations efficiently.

Through the above multi-chain network, MTGT can provide the best solutions for various decentralized applications. This multi-chain architecture eliminates the performance and scalability limitations of a single blockchain, and facilitates the mass adoption of blockchain innovation by businesses. At the same time, it also meets the needs of different application scenarios for customized underlying technologies to maximize application efficiency.

3. MTGT will achieve the following technical innovations

(1) A simplified way to build decentralized apps

MTGT plans to provide users with a visual application development model to simplify decentralized application development, as straightforward as building a traditional website. Developers do not need to focus on the underlying blockchain technical details or understand the Solidity contract language or master cryptography. MTGT will provide a simple and easy-to-use application interface toolset so developers can build blockchain applications by dragging and dropping components. MTGT's visual development tools will include the following features:

Modular interface building tools: Provide common blockchain application components such as distributed databases, blockchain browsers, digital wallets, tokens, smart contracts, API interfaces, etc. Developers can easily build customized applications by dragging and dropping components and setting parameters.

Automated code generation tools: The visual tools can automatically generate Solidity code and web3.js code based on the developer's visual interface operation to simplify the developer's application development.

Streamlined application launch tools: Developers can launch applications directly to MTGT's parallel chains or sub-chains with one-click operation and automatically generate unique application addresses and interfaces.

Application continuous management tools: Developers can manage published applications in visual tools, including operational data viewing, vulnerability fixing, version upgrades, etc.

Common API interfaces: Provide rich blockchain APIs such as contract call APIs, transaction management APIs, digital wallet management APIs to simplify the development process.

With MTGT's visual development tools, developers can easily build and manage their decentralized applications without in-depth knowledge of blockchain technology. Our design will significantly lower the barrier for blockchain application development and development time, efficiently unleash the commercial value of decentralized applications, and promote the overall industry development.

(2) Optimized resource allocation

Decentralized apps require significantly more resources like computing power, network bandwidth, and data validation compared to traditional centralized applications. This often results in resource constraints for decentralized applications. Therefore, when an application needs to obtain additional resources (such as additional computing power, specific data, etc.), we can encourage other applications to open their own resources (earn revenue) through commercial incentive mechanisms to achieve overall optimized resource allocation. We propose an incentive model to encourage apps to open up their resources to others. The specific solution is:

Developer applications can publish specific resource requirements on MTGT. Other applications with idle related resources can respond to the needs and open some resources to meet the needs. MTGT will automatically track the provision and use of resources and calculate the MTGT rewards for each participating provider based on the preset algorithm. Resource providers obtain MTGT token incentives by opening idle resources. This resource circulation and cooperation model enables resources to be used efficiently, creates greater commercial value, and realizes the construction of MTGT into a resource-rich, widely used and collaborative decentralized application network platform. This is also one of our key initiatives to promote the implementation of blockchain technology.

(3) Multi-scenario, multi-way resource settlement

In our design, we need a stable measure of value. The internal settlements between apps will use a stablecoin, not the MTGT token itself. A stablecoin similar to MakerDAO's DAI will be issued on the MTGT main network. Because the amount of resource settlement between applications is huge and frequent transactions, a relatively stable measure is needed. Resource settlement methods include the following:

- Fixed pricing: Pay an upfront listed price;
- Metered pricing: Pay as you go based on usage segments by time, volume, or other metrics;
- Auction: Initiate auctions for all devices that need to call resources, and the highest bidder gets the resources;
- CPP (Cost Per Purchase): Pay according to the final use of the resource.

Using smart contracts, we can solidify various types of settlement methods in the form of code on the decentralized network, thereby solving the problem of trust and improving transaction efficiency. Developers and users can choose suitable methods for settlement according to scenarios to achieve effective resource allocation and transactions. A stable settlement measure and diversified pricing models allow resources to circulate efficiently between applications at reasonable prices, reducing transaction hassle and lowering development and maintenance costs, enabling the widespread deployment of valuable and trusted decentralized applications.

(4) Innovative algorithms ensure the highest level of user security

Cybersecurity will be critical for the future Web3.0. We will detect and mitigate malicious activities by 'bots' and 'bad actors' through innovative BPK algorithms on MTGT, and strive to ensure the users security. In terms of security, we will focus on the following aspects:

MTGT requires all applications developed on the platform to adhere to stringent data privacy policies and prohibit transmitting user data or using it for commercial purposes without user consent. MTGT will also provide data anonymization and encryption tools to help developers build more secure applications.

MTGT will automatically monitor all on-chain and decentralized application

transactions, detect malicious transaction behaviors such as money laundering and fraud, and promptly taking action. This can minimize the use of network resources for illegal activities.

MTGT has designed a complete fault tolerance and disaster recovery mechanism to maintain platform services in the event of system failures, network splits or attacks, thereby ensuring the stable and reliable operation of the network.

We will continue to study various issues related to user and network security that may be encountered in the Web3.0 environment and take appropriate measures to prevent them, eliminate users' doubts about decentralized applications of blockchain technology, and truly achieve large-scale decentralized applications in the Web3.0 environment. We will continue to invest in user data and network security to ensure the secure and stable operation of the MTGT platform and various applications on it. This is key to our competitiveness.

(5) Support high-quality Dapps and build a wide range of MTGT ecosystems

We believe that a broad and high-quality decentralized application (Dapp) ecosystem will be the key to a project's competitiveness and value. MTGT supports commercial Dapps and serves the entire Web3.0 ecosystem. Therefore, an important task of MTGT is to encourage the development of various types of Dapps on it to enhance the value of MTGT and expand its extensive ecosystem. We will implement the following aspects:

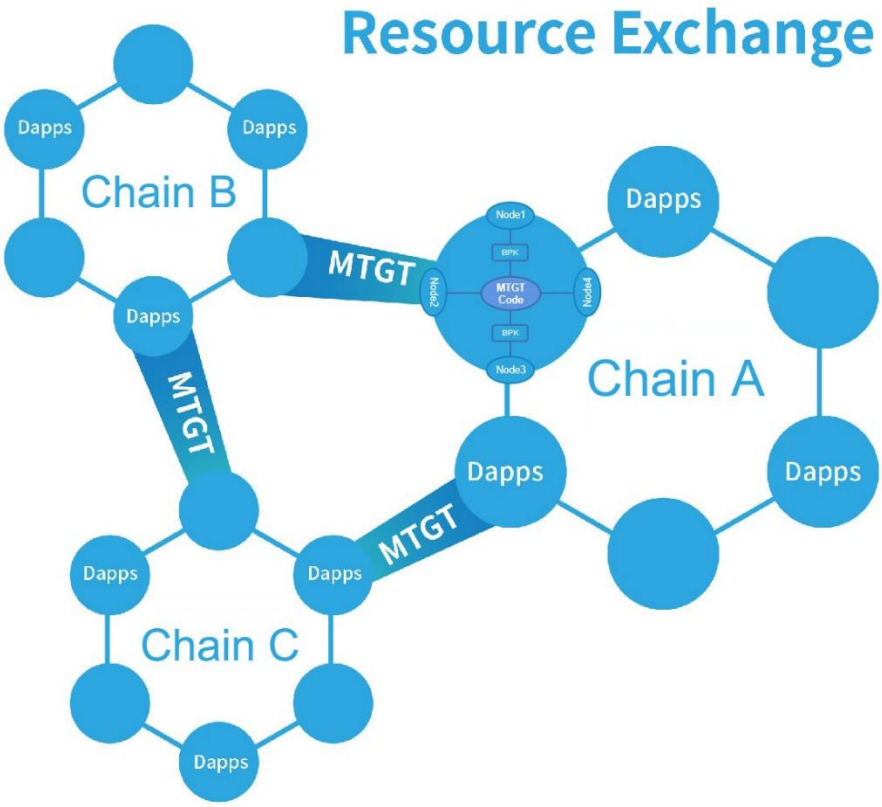
Provide a comprehensive, user-friendly Dapp development tools and resources. Provide a platform for developers to exhibit and discuss their Dapps, stimulating the generation of more innovative applications.

Create a Dapp ecosystem fund to provide grants and investments for promising projects. This helps increase the value of the MTGT network. We will set up a special fund to invest in and encourage high-quality Dapp projects. This will help increase the value and utility of the MTGT network.

Form strategic partnerships. We will reach strategic cooperation with well-known decentralized and centralized exchanges, digital wallets,

intermediary services and other institutions in the industry to recommend high-quality Dapps in the MTGT ecosystem to more users and introduce high-quality Dapps from other platforms into MTGT. This supports our goal of building MTGT into a major public blockchain ecosystem.

V. System Architecture



VI. MTGT Token

The MTGT token is the governance token of the MTGT blockchain network and is a utility token, not a security. Its main functions are:

- Verifying the identities of developers and enterprise users. The MTGT platform requires related users to hold a certain amount of MTGT tokens to use the products and services provided by the platform.
- Paying transaction fees on the network. Various transactions in the MTGT

blockchain service network need to consume MTGT tokens to pay handling fees, which creates a strong circulation demand for MTGT tokens.

- Conferring voting rights in community governance. MTGT token holders have the right to participate in the governance voting of the MTGT blockchain service network.
- Developer reward fee. MTGT regularly rewards developers who have made major contributions to the ecosystem.

The MTGT token issuance plan:

Ticker	MTGT
Total tokens	314,159,265
MTGT Founding Team	50,000,000
Initial & Cornerstone investors	40,000,000
ICO	120,000,000
Mining Pool	90,000,000
Liquidity Inventory	14,159,265

To align the long-term interests of the MTGT team and community and uphold transparency, the MTGT founding team's token will be locked for 2 years and initial & cornerstone investors' tokens will be locked for 1 year after the initial offering. During this period, the MTGT founding team's and initial & cornerstone investors' tokens cannot be transferred or sold. After the lock-up period ends, the token held by the founding team and initial & cornerstone investors can be unlocked in 12 installments.

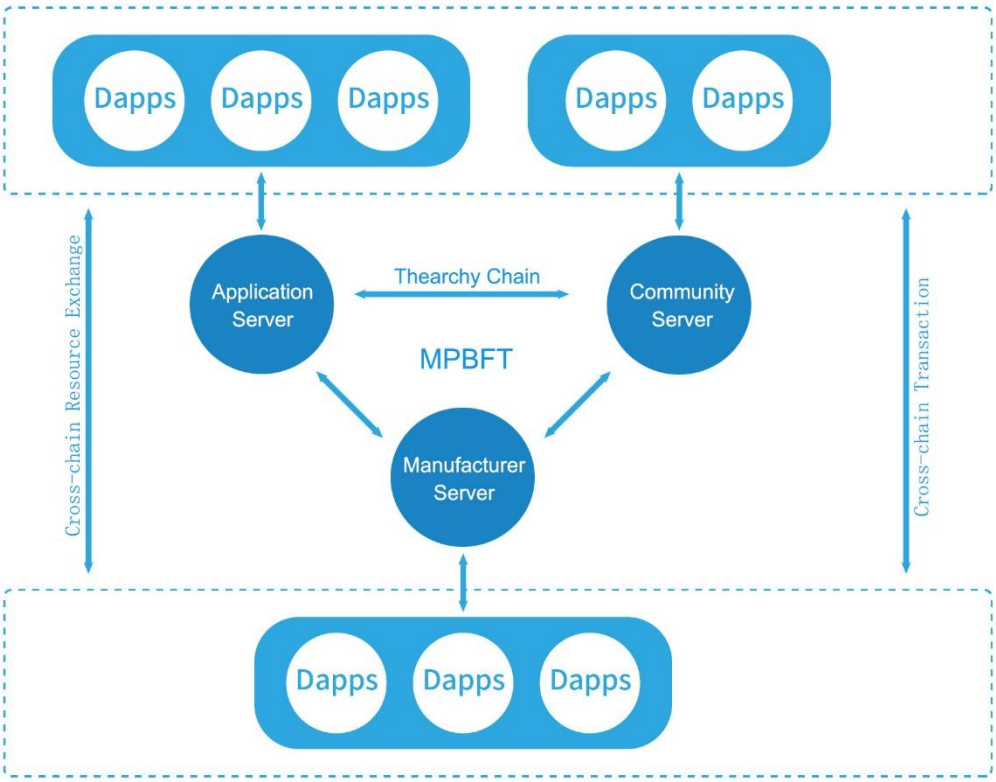
VII. Technical Implementation

MPBFT will be the consensus algorithm of MTGT Chain. If we compare the blockchain to a car, the consensus mechanism is like the engine that powers the vehicle. MPBFT is a faster, more scalable, and more secure option. MPBFT makes specific improvements based on PBFT (Practical Byzantine Fault Tolerance), including:

1. Linear communication: MPBFT achieves linear worst-case communication complexity, compressing PBFT's O(n4).

2. Random leader selection: In each round of MPBFT, the leader is selected through a verifiable random function (VRF) to prevent predictable attacks on the leader.

In the field of cross-chain consensus, based on a deep understanding of the core ideas of Delegated Proof of Stake (DPoS), we have created a new consensus algorithm called "Multi-Chain" according to the practical application scenarios and current Dapp development status. The basic structure is shown below:



The "Thearchy Chain" composed of servers provided by developers, community leaders, and ecological enterprises is the core of the entire architecture. The Thearchy Chain consists of "Thearchy nodes". The generation of Thearchy nodes is selected through the community voting by pledging MTGT, and finally generates 2n+1 Thearchy nodes.

The main functions of the Thearchy Chain are to reach consensus and block generation using the IPBFT consensus algorithm, and to coordinate the work of nodes on the underlying public chains.

The blocks of the Thearchy Chain will retain the following TXs:

1. On-chain governance, contract transactions, MTGT transfer TXs;
2. Node grouping TXs;
3. Node work report TXs.

On-chain governance TX is critical to the continuous operation of the "Thearchy Chain". MTGT holders can vote or withdraw their votes at any time. Thearchy nodes can also register and exit. The system will re-elect according to the votes obtained by nodes once every block cycle. The nodes with the highest votes are elected, while nodes that cannot function properly will be kicked out.
In addition to the "Thearchy Chain", the entire architecture will also contain public chains composed of a large number of application nodes published by different developers.

The nodes on the public chain will continuously read the information on the "Thearchy Chain" to work efficiently. Mainly including:

1. According to the block information of the "Thearchy Chain", determine which node the next block comes from (the blocks of the public chain are also produced by the Thearchy nodes).

2. Read the "Thearchy Chain" information to determine the grouping of the current node and then determine the block data to be saved to complete data sharding.

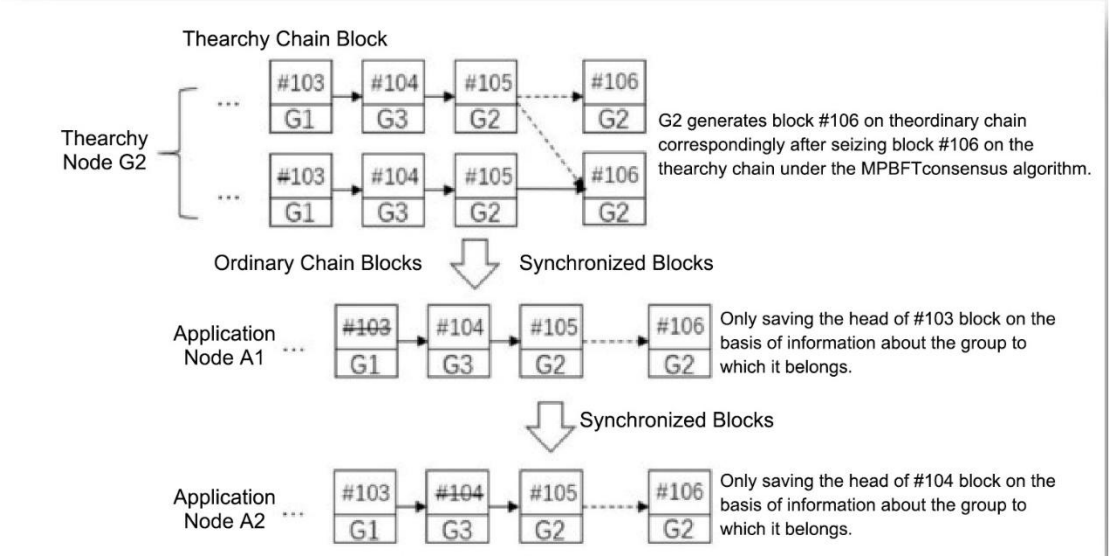
3. Read the legal developer information of the "Thearchy Chain" to determine whether the reported data information of other applications is legitimate.

4. Report the working information of ordinary nodes.

Through this design, the main TXs of the public chain are left with application data collection TXs and scalable smart contract runtime TXs, while the

consensus algorithm logic and device/data legitimacy judgment logic are moved to the Thearchy Chain. Improve the stability and speed of block generation of the public chain, realize data sharding of the public chain, and reduce the performance storage requirements for applications to become blockchain nodes.

The MTGT block generation mechanism is shown below:



MTGT's multi-chain architecture has the following advantages:

- Improve system security. Cross-chain monitoring of Thearchy and public chains can detect failures or attacks in time and issue warnings to reduce risks.
- Increase block production. Thearchy and public chains produce blocks simultaneously to increase total block production and improve network performance. Mutual supervision, calculation and verification will also be implemented. If there is an error in the consensus or block generation process of any chain, participants in the other chain network can object and request re-generation.
- Expand community governance. MTGT token holders participate in the election of "Thearchy nodes" to express community opinions more widely and achieve decentralized governance.
- Incentivize MTGT token holdings. Pledge MTGT tokens to participate in the election of "Thearchy nodes" and consensus rewards to create strong demand for holding MTGT tokens and promote their stable value appreciation.

- Cross-chain interoperability. The "Thearchy Chain" can coordinate different chains to achieve cross-chain interoperability and cooperation and expand the MTGT ecosystem.

While inheriting the characteristics of DPoS, MTGT's dual-chain architecture builds upon DPoS to achieve greater scalability, efficiency, and flexibility while maintaining security and stability. The dual-chain architecture also enables interoperability between public, private and consortium chains and lays a solid technical foundation for fully expanding the MTGT ecosystem.

VIII. Mining Mechanism

MTGT has designed an economic model that rewards developers and applications for providing services and reporting key data to the network. To enable sustainable network, MTGT developed an incentive model that decouples block production from revenue generation.

The core content of this mechanism is as follows:

- Qualified applications regularly submit “Node Work Report” transactions to the Thearchy Chain with details on the work they have performed. Work status includes: application startup, application shutdown, application completes, etc. and supports expansion.
- Over a given time period, the Thearchy Chain collects Node Work Report data from all network applications
- MTGT discloses the salary calculation algorithm publicly. The input is the work records of all applications within this time period. The output is the salary table for each application. Based on these data, MTGT calculates revenue allocations for each application, which are distributed after the calculation period ends. This algorithm is iteratively optimized in each cycle to identify data fraud.

The incentive mechanism we have designed solves the problem that the parameters of the blockchain economic model are difficult to modify. That is, rewards are issued based on the actual work of applications instead of the typical model of rewarding miners solely based on block production, so as to maintain the openness and fairness of the core mechanisms of the blockchain.

VIIII. Smart Contract

Smart contracts are a core component of blockchain technology and the underlying basis for various decentralized applications. They also facilitate seamless coordination between different applications in the MTGT ecosystem.

Given that Dapps in the Ethereum community have thrived, most developers have been used to developing smart contracts based on the EVM virtual machine. To better attract developers, MTGT plans to achieve EVM compatibility, support Solidity language written smart contracts, and gradually achieve WASM compatibility, while supporting smart contracts written in multiple languages, such as C++, Java, Python, and JavaScript. Compared with Ethereum, execution efficiency will be increased by several times.

We have deployed in multiple areas in smart contracts. The blockchain technology applied has an extremely high balance in both compatibility and innovation. It can seamlessly connect with the EVM ecosystem to quickly build a developer and user base, and it can also explore more efficient new technologies and new application scenarios based on WASM.

X. Network Design

To meet the diverse needs of MTGT's many applications, the network adopts an improved version of the MQTT ((Message Queuing Telemetry Transport)) protocol for application data transport along with a customized P2P solution for Sovereignty Chain consensus.

In addition, for data transmission between Thearchy Nodes, we plan to adopt an improved BDT (Bucky Data Transform) P2P solution, which has the following advantages:

- The protocol supports UDP NAT traversal, a decentralized topology, multi-party control, and IPv6 with high connectivity.
- Its DHT structure enables efficient, redundant broadcast messaging.
- Inbuilt congestion control provides higher throughput than TCP

MTGT's network design follows a modular approach:

- MQTT handles application layer data transport
- BDT-P2P optimizes the backbone network across the entire network with a clear and simple architecture

This clear yet flexible architecture can evolve to meet future network requirements.

XI. MTGT Application Scenarios and Dapps

As decentralized applications become more sophisticated and accessible, they are poised to permeate many areas of life. Real-time trusted data exchange and automatic transactions between applications and applications, people and applications will be widely used through distributed Dapps. In view of the above scenarios, we have summarized some applicable scenarios based on the powerful functions of MTGT as follows:

1. Non-Fungible Tokens (NFT)

NFTs represent ownership of unique digital or real-world assets. While the ownership and value of NFT-represented assets are recorded on the blockchain, the assets themselves remain visible and usable by others. NFTs enable new models of on-chain asset ownership and exchange for digital collectibles, game items, artwork, financial instruments, real-world goods, and more.

NFT brings new opportunities for asset digitization and asset management, allowing originally discrete digital assets and physical assets to circulate on the blockchain, creating an entirely new asset trading environment. NFT is reshaping the concept of assets, asset management methods and asset exchange methods, which will have an unprecedented impact on the future development of many industries.

2. Smart/Decentralized Finance

Smart finance utilizes the distributed, tamper-proof and traceable features of the blockchain to improve the authenticity and security of financial information and data. By increasing the level of trust between the two parties, it helps solve

the problems of fraud in letters of credit, multi-type financing products, orders, etc. Decentralized financial services and products based on blockchain technology are thriving. For example, decentralized exchanges use automatic market making and asset exchange pool algorithms to run on-chain in the form of smart contracts. Financial derivatives, lending economy, etc. provide new financial services and features on the blockchain through smart contracts. In short, the development of blockchain technology and smart contracts is profoundly restructuring the financial industry, promoting changes in the way financial services are provided, and the financial system will develop in a more transparent, efficient and secure manner.

3. Smart Insurance

With the development of decentralized finance, simple Defi applications face more risks, therefore smart insurance is another important means to prevent risks. Smart insurance on the blockchain can be achieved through smart contracts. The insurance contracts generated by smart contracts are digitized and stored in the blockchain ledger, tamper-proof. Smart insurance contracts can also automatically process insurance claim procedures to achieve near real-time review, verification and payment. This makes the claims process efficient and convenient. Smart insurance will reconstruct the current traditional insurance system and bring a new model that is simple, efficient and sustainable.

4. Other Applications

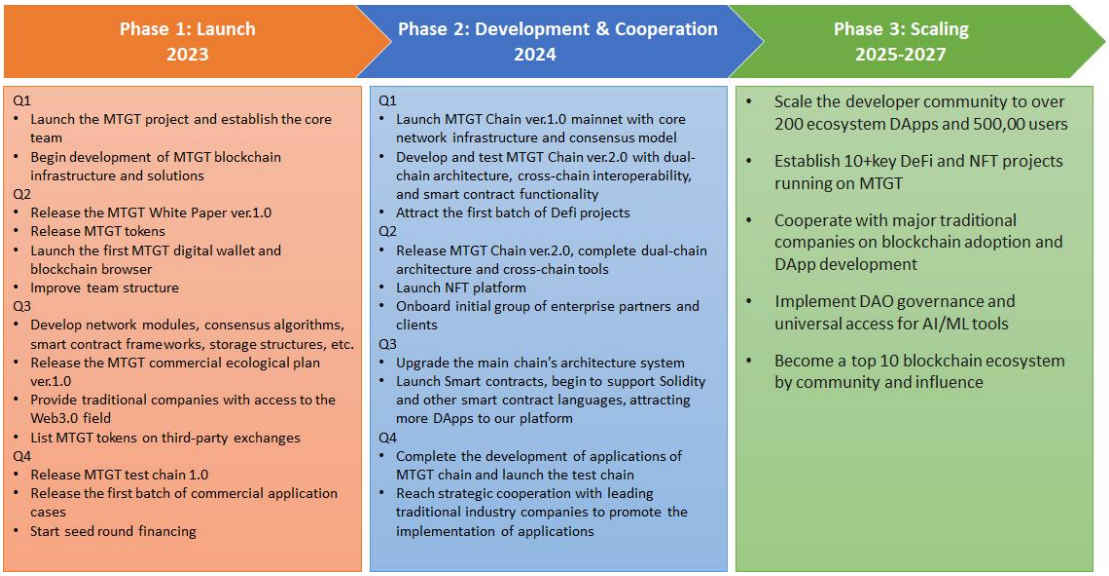
MTGT also supports various trusted decentralized applications, including GameFi, DAO, blockchain social platforms, etc. We are committed to building MTGT into a rich and diverse ecosystem.

XII. Roadmap

In the next 3-5 years, the MTGT project will accelerate the industrialization of blockchain technology by evolving underlying technologies, enriching application scenarios, and cooperating with multi-industries enterprises. MTGT will gradually develop its initial technical advantages into industrial advantages. If the milestones of our roadmap can be completed as scheduled, MTGT will surely become an important link connecting blockchain technology with the

real economy and provide solutions to commercialization issues. This is also the strategic positioning of MTGT's long-term development.

MTGT's roadmap for the next 3-5 years is as follows:



The focus of MTGT's work in the next 3-5 years will be:

- Underlying technology: Release MTGT Chain ver.1.0 and ver.112.0 to build a dual-chain architecture and smart contracts;
- Ecological construction: Release business plans, enrich application scenarios, and attract developers to join;
- Industrial cooperation: Cooperate with enterprises to promote application using blockchain technology;
- Universal development: Start seamless docking with artificial intelligence to achieve universal participation in research & development;
- Global influence: Leverage a robust technical architecture and ecosystem to become a leading blockchain community and platform globally.

XIII. MTGT Financial System

The MTGT Foundation is a non-profit organization based on the MTGT blockchain platform.

1. MTGT Foundation Governance

The MTGT Foundation is governed by a Management Committee with rotating

leadership. Committee members elect a new chair every two years, with each chair serving a single term. The MTGT Foundation Management Committee has established several management centers, including the Blockchain Technology Development Center, the Blockchain Commercial Application Center, the Financial Management Center, the Risk Control Management Center, and the Comprehensive Affairs Management Center. Each center guides its responsible departments to carry out work.

2. Sources of Funds and Funds Management

The funds of the MTGT Foundation mainly come from initial investors investments, token sales, membership dues, and donations. When necessary, the MTGT Foundation will exchange part of the MTGT tokens for other forms of equity assets for project operation.

3. Financial Management Description

The MTGT Foundation adheres to principles of sound financial planning, oversight, and accountability with an emphasis on effective allocation of resources.

The Foundation's assets and budgets are managed comprehensively. Annual budgets are reviewed by the Standing Committee and monthly budgets by the Executive Committee based on operational needs. The Financial Management Center is responsible for preparing and executing the financial budget and disclosing it quarterly.

Financial reports disclosure: Official website https://metagate.top

Independent third-party audits of the Foundation's finances and operations are conducted annually. Audit results are published along with the Foundation's annual disclosures.

XIV. MTGT Legal System

The MTGT Foundation retains top international law firms to advise on all legal matters related to the MTGT project.