DECENTRALGPT WHITEPAPER

AI+DePIN+AGI

"Arrival of the decentralized LLMs era for all."

Contents

1 Introduction

In the field of artificial intelligence, especially in the development and application of large-scale la nguage models such as the GPT series, dependence on centralized computing resources has beco me a major bottleneck. This dependence not only incurs high costs but also raises serious concer ns about data privacy, accessibility, and transparency. Data processing and storage in centralized s ystems are usually concentrated in a few large data centers. This concentration is not only an easy target for hackers but also may lead to excessive centralization of control over data, thus affectin g the fairness and transparency of the data.

DecentralGPT presents an innovative solution to the centralization model. As a decentralized AI lar ge language model inference network, DecentralGPT supports a variety of open-source large lang uage models. It is committed to building a secure, privacy-preserving, democratic, and transparent artificial general intelligence (AGI) network. The distributed network nodes jointly complete data processing and model inference tasks. DecentralGPT greatly reduces dependence on a single com puting center, enhances the system's resistance to attacks, and improves global computing efficie ncy and resource utilization.

Additionally, the decentralized nature of DecentralGPT ensures the democratization of technology so that users from different regions and backgrounds can participate and benefit equally. By impl ementing end-to-end encryption and strict data access controls across the network, it protects us er data from unauthorized access or abuse, thus solving the privacy protection problem in the tra ditional centralized model. At the same time, the open-source nature of DecentralGPT also promo tes collaboration within the global developer community and fosters the rapid iteration and optim ization of technology.

By breaking the limitations of traditional AI models, DecentralGPT has opened up a new path for t he development of global AI technology. It heralds a more secure, fair, and open AI future.

2 Global AIGC Industry Analysis and AGI Outlook

2.1 Market Value of AIGC Industry

The AI Generated Content (AIGC) industry is rapidly becoming an important area of global scientific and technological development, covering the automated generation of a wide range of content from text, images, and video to music. With technological progress and the expansion of application fields, AIGC is gradually changing the operation modes of the media, advertising, entertainment, and education industries. Especially in terms of content production, personalized marketing, and user interaction experience, AIGC provides efficient and cost-effective solutions, enabling businesses to create and distribute content at unprecedented speeds and scales.

In many important areas, such as media publishing, digital advertising, social media content production, and internal content management, AIGC technology has become a key tool for improving productivity and content personalization.

Media and News

- **Case:** The New York Times uses AIGC technology to automatically generate sports news and financial bulletins. It achieves faster content update speeds than manual work and dynamically adjusts reports according to readers' feedback.
- **Data:** Media companies utilizing AIGC experienced a 40% reduction in average content production time and a 30% increase in content relevance and audience engagement.

The Advertising Industry

- **Case:** A leading online retailer used AIGC to create personalized ads and saw a 20% increase in click-through rates. The return on advertising investment has increased significantly.
- **Data:** AIGC technology has increased the click-through rate of advertising campaigns by 20-30% and improved the cost-effectiveness of advertising by 50% compared with traditional methods.

Educational Technology

- **Case:** Online education platforms use AIGC to generate personalized learning materials and interactive learning experiences for each user. Students' learning efficiency has increased by an average of 35%.

- **Data:** Educational institutions that adopted AIGC saw a 40% increase in student engagem ent and a 50% increase in student satisfaction.

2.2 Potential Growth of Future Market Size

Based on the latest market research, the market size of the AIGC industry is expected to reach trill ions of dollars in the next decade. This growth is mainly driven by the following factors:

Technological Innovation: With the progress of AI and machine learning algorith ms, generative models are becoming increasingly accurate and efficient. This is especi ally true for the latest generation of language models, such as GPT and BERT, which c an generate text and images that almost match human quality.

Enterprise Demand Growth: Digital transformation has driven a sharp increase i n enterprise demand. Enterprises need to generate a large amount of content quickly and require this content to be highly personalized and adaptable. It is expected that by 2025, at least 60% of large enterprises worldwide will use AIGC technology.

Cost Reductions: AIGC can reduce content production costs by up to 70%, especi ally where large-scale content generation is required. 90% of the enterprises surveyed stated that cost savings were the main motivation for their adoption of AIGC technolo

Development in Emerging Markets: The demand for AIGC in emerging markets is growing rapidly as Internet coverage and technology acceptance increase. Especially in Asia and Africa, the market growth rate is expected to exceed the global average, r eaching an average of more than 35% annually.

Affordable Gaming: Enable everyone to easily play games without the need to pu rchase expensive gaming devices.

2.3 AGI's Future Outlook

Artificial General Intelligence (AGI) is the ultimate goal in the field of AI, representing an intelligent system that can rival or even surpass humans in understanding, learning, and adapting to new situations. The realization of AGI will be a major breakthrough in human history, signifying that machines can perform any cognitive task that human intelligence can accomplish.

We expect AGI to arrive in 5-10 years, with a wide range of potential applications, from complex decision support systems to fully autonomous service robots. Many scientists and researchers are working on making machines exhibit a wide range of intelligence and adaptability, which involves breakthroughs in areas such as reinforcement learning and autonomous affective cognition.

Moving forward, AGI could bring fundamental changes to society. In the medical field, AGI can help design personalized treatment plans and perform complex surgical procedures. In environmental protection, AGI can analyze and predict environmental changes and propose effective protection measures. Additionally, AGI has significant application potential in education, finance, law, and other fields, providing more accurate and efficient services.

2.4 Role of DecentralGPT in AGI

DecentralGPT plays a vital role in the development of AGI. As a decentralized AI model inference network, DecentralGPT offers new possibilities through its unique decentralized network structure, supporting the development of AGI and addressing some of the challenges faced by existing centralization models.

First of all, DecentralGPT's decentralized architecture can significantly improve computational efficiency and reduce operating costs. In the traditional centralized model, all data and computing needs are concentrated in a few large data centers. This not only increases costs but can also lead to processing bottlenecks and delays. Through distributed computing resources, DecentralGPT can balance the load on a global scale, achieving rapid response and efficient operation.

Second, DecentralGPT strengthens data security and privacy. In this network, data can be processed without leaving the local environment, effectively reducing the risk of data leakage and abuse. This is particularly important for building trust and promoting AGI technology, especially when dealing with sensitive information such as medical records and personal financial data.

Finally, DecentralGPT supports the democratization and globalization of AGI technology. It provides equal opportunities for researchers and developers around the world to participate, regardless of their location. They can use this platform to develop and test AGI applications. This helps promote global innovation and accelerates the research and application of AGI technology.

Through these mechanisms, DecentralGPT not only supports AGI's technological advances but also provides new perspectives and tools for its social implementation and ethical discussion.

3 Overview of DecentralGPT

DecentralGPT is a decentralized AI large language model inference network that supports multiple open-source and close-source large language models. Its design goal is to build a universal AGI that is secure, privacy-preserving, democratic, transparent, opensource, and available to everyone. This network leverages many advantages of decentralized technology, including enhanced data security, privacy protection, improved efficiency, and reduced costs through distributed computing resources. DecentralGPT charges for providing computational power APIs to the application layer. DecentralGPT serves to not only decentralized applications but also centralized ones. Positioned as a decentralized OpenAI, DecentralGPT offers B2B and B2C users a more secure, efficient, and cost-effective alternative solution.

3.1 Core Features of DecentralGPT

Decentralized architecture: DecentralGPT uses a distributed network of nodes located all over the world. Each node can independently run the tasks of the AI model. This layout helps to reduce dependence on a single data center, increasing the system's stability and resistance to attacks.

Privacy and Security: In DecentralGPT, data is handled according to strict privacy protection standards. Data can be encrypted at the local node to minimize the risk of privacy disclosure caused by centralized data processing.

Democratic Access: The decentralized structure allows users and developers from all over the world equal access to AGI resources. Users in both developed and developing countries can use this platform to develop and innovate AI applications.

Support for Multiple Models and Open Source: The platform is not limited to specific AI models but supports a variety of open-source large language models. This openness ensures the transparency and accessibility of the technology, allowing researchers and developers to collaborate in improving and optimizing the models.

3.2 Potential impact of DecentralGPT

Improve Efficiency and Reduce Costs: By leveraging globally distributed computing resources, DecentralGPT optimizes resource usage. This increases processing speed while reducing the costs associated with centralized computing resources.

Drive Technological Innovation: Open model support and global participation promote the rapid iteration and innovation of technology, accelerating the development of artificial intelligence.

Enhancing Social Equity: DecentralGPT helps bridge the technology gap by making advanced AI technologies accessible and available to users around the world. This enhances the overall technological level and application capability of the global comm

These features and goals of DecentralGPT demonstrate its potential role in advancing the field of artificial intelligence, especially in promoting the development of AGI towards democratization and globalization.

3.3 More unique value of DecentralGPT

Democratizing Technology Access

DecentralGPT significantly enhances global users' access to advanced artif icial intelligence technology through its decentralized structure. In traditional cen tralized models, advanced AI services are often concentrated in technologically a dvanced regions, leaving other areas unable to enjoy the same level of service d ue to resource and technology limitations. DecentralGPT breaks down these barri ers by utilizing globally distributed nodes, ensuring that users in any region can r eceive fast responses and high-quality AI processing capabilities. This widespread approach greatly promotes balanced technological development worldwide, allo wing individuals and businesses in less technologically developed regions to ben efit from AI advancements.

Environment Friendly

DecentralGPT's decentralized network reduces reliance on a single data ce nter, which not only increases system redundancy and resiliency but also disperse s the environmental impact. In centralized systems, large data centers consume h uge amounts of power and generate large amounts of heat. Distributed systems, on the other hand, consist of many small, decentralized nodes, often running on l ocal renewable energy, reducing dependence on fossil fuels. Additionally, decentr alization reduces the distance of data transmission, further lowering energy consu mption and improving the energy efficiency ratio of the whole system.

Enhanced Data Sovereignty and Control

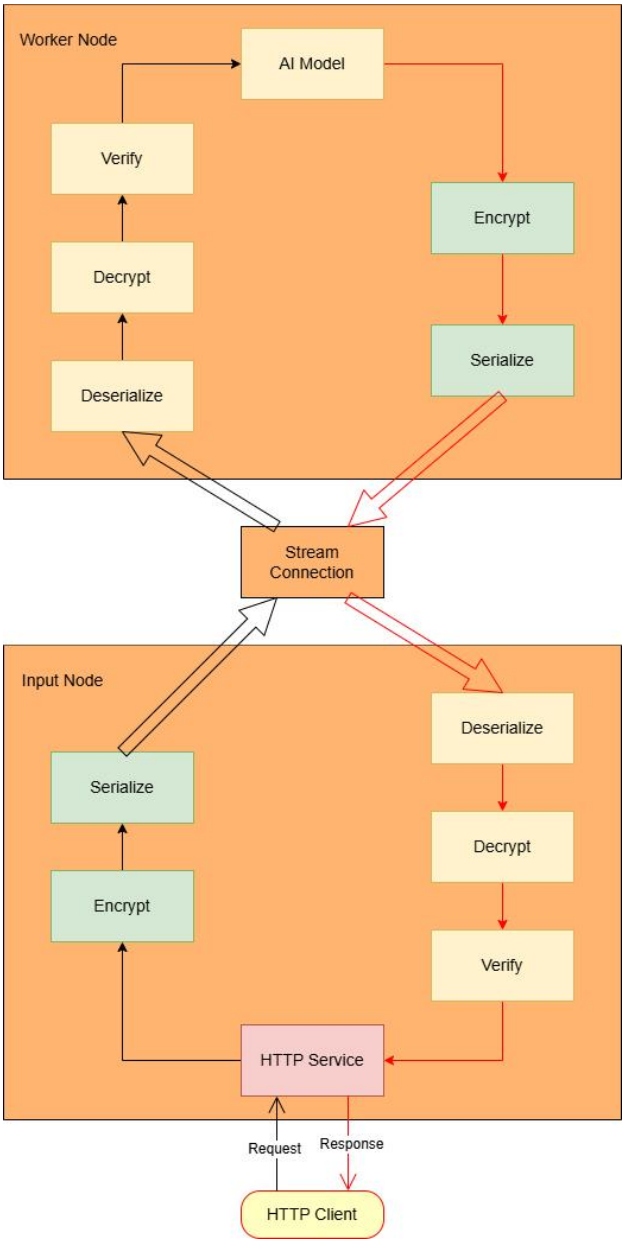
DecentralGPT provides greater data sovereignty and control through its decentralized architecture. Users' data is processed in the local node and does not need to be transmitted to a remote server. This way, users have more direct control over their data, reducing the risk of unauthorized access or abuse. Additionally, DecentralGPT enforces strict data governance policies and supports compliance with regional regulations, such as the European Union's General Data Protection Regulation (GDPR). This makes the system more suitable for application scenarios requiring strict data protection, such as medical and financial fields, providing users and enterprises with higher trust and compliance.

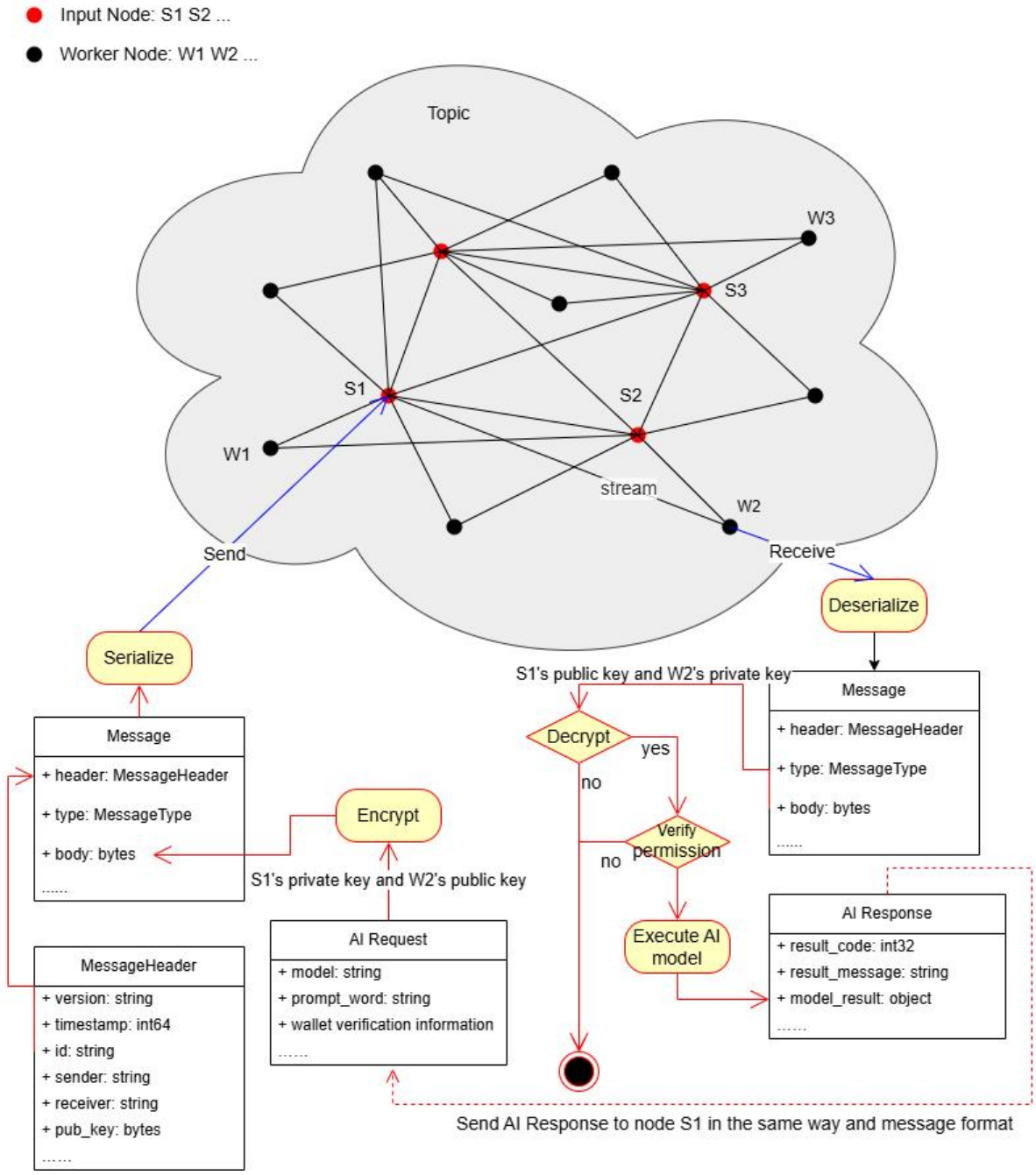
Through these unique values, DecentralGPT is more than just a technology product. It is also an important force in promoting the sustainable development of society, the economy, and the environment.

4 DecentralGPT Technical Architecture

To design a technical architecture diagram for DecentralGPT, we started with its core components and examined how it functions. Below is an overview of the DecentralGPT technical architecture a long with a simplified architecture diagram:

System Technical Architecture Diagram and Code Logic Diagram




Input Node: S1 S2 ...
Worker Node: W1 W2 ...
Topic
W3
S3
S1
S2
W1
stream
W2
Send
Receive
Deserialize
Serialize
S1's public key and W2's private key
Message
+ header: MessageHeader
+ type: MessageType
+ body: bytes
.....
Decrypt
yes
no
Verify permission
no
Encrypt
S1's private key and W2's public key
Message
+ header: MessageHeader
+ type: MessageType
+ body: bytes
.....
AI Request
+ model: string
+ prompt_word: string
+ wallet verification information
.....
Execute AI model
AI Response
+ result_code: int32
+ result_message: string
+ model_result: object
.....
MessageHeader
+ version: string
+ timestamp: int64
+ id: string
+ sender: string
+ receiver: string
+ pub_key: bytes
.....
Send AI Response to node S1 in the same way and message format

4.1 DecentralGPT System Architecture Details

4.1.1. User Interface

Users can interact with the DecentralGPT system through the interface of any client node. The interface handles user requests, which can be queries, data entry, or administrative commands to the AI model. The duties of the user interface include collecting user instructions and data, encrypting this information, and sending it to the distributed GPU nodes of the system for processing.

4.1.2. Distributed Coordinator

Another function of the client node is the distributed coordinator, which can query the GPU node status of the whole network, including task allocation and load balancing. It receives the encrypted request from the user interface and selects a list of GPU nodes that meet the requirements. Then, a random machine on the blockchain selects a GPU node to execute the task. The coordinator also monitors the performance and resource usage of each node to optimize task allocation and system efficiency.

4.1.3. Distributed Computing Node

Node Composition: Compute nodes form the core of DecentralGPT, and each node is equipped with a GPU. The inference tasks of the AI model can be performed individually or collectively. These nodes are distributed in different locations around the world, forming a powerful distributed AI inference computing network.

Operating System and Software: Each node runs the Ubuntu operating system or other systems. The necessary software and libraries are installed to support the running of the AI model. This configuration ensures the compatibility and efficiency of the system.

P2P Network: The nodes are connected through a peer-to-peer (P2P) network. This structure enhances the reliability and data transmission speed of the network. P2P networks facilitate direct data and resource sharing among peers.

4.1.4. Distributed GPU Machines

Distributed GPU Machine: The distributed system includes a GPU node network, which is composed of distributed single nodes or cluster nodes. The GPU node program can invoke the AI model to perform inference on the GPU machine.

AI Model Execution: The inference of the AI model mainly depends on the powerful computing power of GPUs. The AI model can effectively use GPUs for high-speed computing.

4.1.5. System Architecture Summary

The DecentralGPT system provides efficient and scalable AI model inference capabilities through its distributed architecture. By using distributed storage technologies such as IPFS and GPU acceleration, as well as powerful P2P networks, DecentralGPT can handle large-scale data requests while maintaining data security and privacy. The system is designed to support highly concurrent AI processing tasks while reducing latency and increasing the overall reliability of the system.

5 Core Functions of DecentralGPT

DecentralGPT provides computing power APIs to the application layer, enabling applications under DecentralGPT to perform various actions using AI power. For instance, DecentralGPT has developed a large language model called DeGPT (which includes multiple models such as Llama 3.1 405B and Ali Qwen 2 72B, etc.). Here are some of the core features of DecentralGPT and their detailed descriptions:

5.1 Natural Language Understanding and Generation

DecentralGPT can understand and generate natural language, allowing it to have smooth conversations with users, answer questions, write articles, write code, or generate any form of textual content. This function is based on advanced deep learning models, such as the GPT series. It learns language patterns and knowledge by analyzing large amounts of text data. In DecentralGPT, this capability is not limited to a single centralized server but is performed by globally distributed nodes. This ensures the scalability and response speed of processing power and enhances data privacy protection through localization.

5.2 Multi-language Support

Unlike ChatGPT, DecentralGPT was designed with the importance of multilingual support in mind, allowing it to serve users worldwide. It takes advantage of the geographical and cultural diversity of distributed nodes to optimize and customize the processing power for different languages. For example, a node in France might be better at handling French content, while a node in Japan optimizes the processing of Japanese. This distributed and localized processing not only improves the accuracy of language processing but also speeds up response times.

5.3 Personalized User Experience

DecentralGPT enhances the user experience by analyzing the user's interaction history and preferences to provide customized responses and recommendations. This function is enhanced under the decentralized architecture because each node can store and process information related to specific users without needing to transmit the data back to a central server. This not only improves the

efficiency and speed of data processing but also increases the security and privacy protection of u ser data.

5.4 Seamless Integration and Scalability

DecentralGPT allows developers and enterprises to easily integrate and extend services through o pen APIs and an extensive network of nodes. This platform supports multiple programming langu ages and frameworks, making integration easy and fast, from small applications to large enterpris e systems. Additionally, due to its distributed nature, DecentralGPT can dynamically adjust resourc es on a global scale in response to changes in demand, thereby providing seamless scalability.

5.5 Enhanced Privacy and Security

In a decentralized DecentralGPT system, user data is encrypted at the local node, and only encryp ted data is transmitted over the network. This strategy greatly enhances the security and privacy o f data, as sensitive information does not need to leave the user's geographical location. Additional ly, the design of the whole system adopts the latest encryption technologies and security protocol s to ensure the security of data during storage and transmission.

5.6 Highly Customizable User Interface and Experience

DecentralGPT provides a highly customizable user interface and interactive experience, supporting enterprises and developers in customizing the interface and functions according to their specific needs. Users can customize the interaction logic, interface style, and even functional modules acc ording to the preferences of the target user group, such as adding specialized commands or integ rating specific external APIs. This high degree of customization allows DecentralGPT to be better i ntegrated into various business applications and services.

With these features, DecentralGPT not only provides powerful language processing capabilities si milar to ChatGPT, but it also improves the efficiency, scalability, privacy, and security of the system through decentralization technology. This makes DecentralGPT a powerful AI platform for diverse global needs.

6 Distributed GPU Mining Mechanism

DecentralGPT uses a distributed GPU mining mechanism, which not only emphasizes the contribut ion of computing power but also plays an important role in maintaining network liveness and sup porting model development. The following is a detailed description of the mining mechanism:

6.1 DecentralGPT's Basic Framework for Distributed GPU Mining

In the DecentralGPT ecosystem, mining rewards are an important means of motivating participant s, including GPU miners and model developers. The total supply of tokens is 1 trillion, of which 4 0%, or 400 billion DGC tokens, are allocated for mining rewards. These rewards will be distributed through a gradual halving mechanism over a four-year cycle after launch. This means that the mi ning reward will be reduced by 50% every four years, thus controlling inflation and increasing the scarcity of tokens, thereby increasing the potential value for holders.

6.2 Mining Mechanism Details of DecentralGPT

6.2.1. Network Participation and Reward Conditions

To participate in mining and receive DGC rewards, miners must use long-lease mode GPU machin es that pledge DBC tokens in the DBC network. This requirement ensures the security of the netw ork and the commitment of the participants. Whenever a user sends a request to one of these GP U machines and the request is successfully processed, the machine is eligible for a DGC reward.

6.2.2. Reward Distribution Cycle

Every 120 blocks, approximately once an hour, the network automatically performs a reward alloca tion, with a total of 5,707,763 DGCs per allocation. Miners can apply for their share of the reward at any time, and once any miner receives their reward, other miners will also automatically receive their share of the reward.

6.2.3. Proportion of Computing Power and Reward Calculation

The specific amount of reward depends on the ratio of the computing power of each miner's machine to the total computing power of the network. For example, if a miner's GPU power is 1000 and the total power of the entire network is 1,000,000, then the miner will receive a 1% share of the reward. This method fairly reflects the actual value of each miner's contribution to the network.

6.2.4. Revenue Allocation Between Model Developers and GPU Miners

In this mining mechanism, the interests of model developers and GPU miners are balanced. Specifically, model developers can receive 30% of the mining reward to acknowledge their efforts in developing and optimizing AI models. GPU miners receive the remaining 70% reward to compensate for the cost and effort required to provide computing resources and maintain the network.

6.2.5. Sustainability of the System and Automatic Destruction Mechanisms

To maintain the long-term sustainability of the system, DecentralGPT introduces an automatic destruction mechanism. All user payments (such as monthly fees) will be 100% automatically destroyed, meaning that the relevant DGC tokens will be permanently removed from the market. This further controls inflation and increases the value of the remaining tokens.

6.2.6. Conclusion of DecentralGPT's Distributed Mining Mechanism

Through this unique distributed GPU mining mechanism, DecentralGPT not only provides strong economic incentives for network participants but also promotes the security and stability of the network. This mechanism ensures that the interests of participants align with the overall interests of the network and promotes the continuous development of technology and the community. Additionally, through DGC's token economics and reward allocation strategy, DecentralGPT builds an ecosystem that is scalable, efficient, and self-sustaining.

7 DGC Tokenomics Model

The DGC token is the core economic unit of the DecentralGPT platform, designed to support the operation of its decentralized AI network. Its economic model is based on a multidimensional fra mework that combines deflationary strategies (a 100% burn mechanism ensures the short term D GC value fluctuation), incentives (a healthy and positive mining rewards cycle), and sustainable de velopment (the integration of node sales plays a pivotal role in driving sustainable growth by ens uring long-term network stability and scalability.). The following is an in-depth analysis and innova tive expansion of the DGC tokenomics model.

7.1 DGC Token Allocation

7.1.1. Total Supply and Distribution

The total supply of DGC is set at 1 trillion. The distribution is as follows:

- **Mining Rewards:** 40% (400 billion) to incentivize miners and model developers. This porti on aims to keep the network active and improve the quality of the model.
- **Airdrop Reward:** 10% (100 billion) is used to enhance community participation and expan d the user base.
- **Team:** 10% (100 billion) is awarded to team members to reward their initial contribution a nd continued development.
- **DGC Foundation:** 10% (100 billion) supports the operation of the Foundation and various project funding.
- **Early Investors and Public Sales:** 30% (300 billion) is used to raise funds to support the e arly development of the project. For instance, angel round financing, node sale, etc.

7.1.2. Deflation Mechanism

DGC adopts a strong deflation mechanism, whereby 100% of the user's monthly and quarterly fee s are destroyed. This means that all DGCs paid through subscription services will be permanently r emoved from the circulation market, thereby reducing the total amount of tokens in circulation. T his increases the scarcity and potential value of the tokens.

7.2 DGC Mining and Rewards

Halving mechanism

The halving mechanism of mining rewards is designed to halve every four years for 100 years until the 400 billion rewards are fully distributed. This long-term halving strategy helps maintain the token's value, ensuring stability and growth over the long term.

Mining Cycle

The DGC sets a period for issuing a reward every 120 blocks, about once an hour, and the total number of rewards each time is 5,707,763 DGC.This mechanism ensures the frequency and fairness of rewards and encourages miners to continue to participate in network maintenance.

Distribution of rewards

Seventy percent of the mining output is allocated to miners who provide computing power, while thirty percent is allocated to developers who participate in the development of large models. This allocation method aims to balance the relationship between technology contribution and resource input, stimulating the production of more high-quality AI models.

8 Roadmap and Plan

8.1 Roadmap

October 2023: The preliminary data synchronization function between nodes is implemented, enhancing the stability and data consistency of the network.

November 2023: Advanced security features such as multi-factor authentication and end-to-end encryption are added to protect user data.

December 2023: Internal beta release completed.

January 2024: The first round of product iteration is carried out based on feedback from internal test users, optimizing the performance and scalability of the network.

February 2024: Enhanced capabilities of AI models, especially in natural language processing and content generation.

March 2024: Multi-language support is introduced to meet the needs of users worldwide.

April 2024: The user interface and experience are optimized to make operations more intuitive and smooth.

May 2024: Completde further optimization of the AI model to improve its accuracy and response speed.

June 2024: Expanded the scale of the decentralized network and added more nodes to enhance processing capacity and anti-attack capabilities.

July 2024: Introduced blockchain technology to further enhance data security and transparency.

August 2024: Enabled broader API access for developers and enterprise customers to build their own applications.

September 2024: Started developing customized AI solutions for specific industries (such as finance and medical).

October 2024: Strengthened community and developer relationships and increased engagement through workshops and hackathons. Formed strategic partnerships with big DePIN ecosystem projects.

8.2 Development Plan

Q4 2024:

- Complete the stable release of all major functions and prepare for full commercial promotion.
- Implement a global market expansion strategy, especially promoting activities in non-English speaking countries.
- Introduce a continuous iteration cycle driven by user feedback and market demand.
- Bring the smart contract function online and issue test tokens.
- Node Sale/ Public Sale goes online.

Q1 2025:

- Further improve and optimize the AI model, especially in understanding complex queries and multi-context communication.
- Strengthen cooperation with universities and research institutions to promote the research and application of advanced technology.
- Implement more sophisticated data analysis tools to help users better understand and utilize the DecentralGPT platform.