Axlflops Network

Democratizing AI Computing with Blockchain Network

Whitepaper

October 2024

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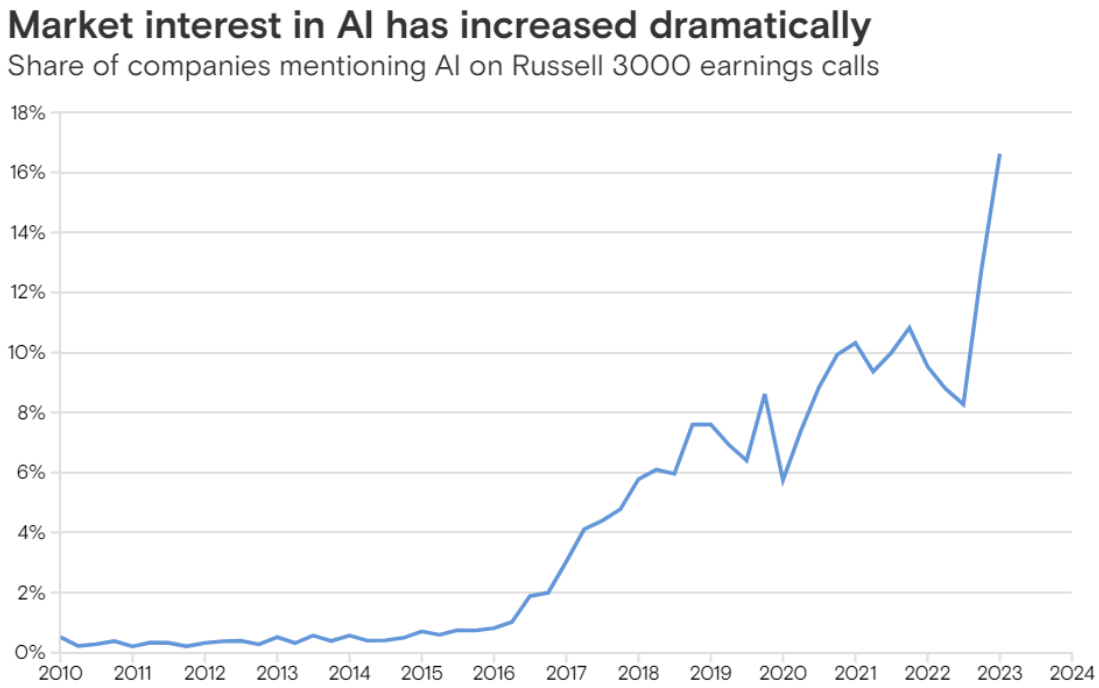
Introduction

Development of Artificial Intelligence (AI)

The evolution of AI has been marked by various milestones from its inception. Initially, AI research was focused on symbolic approaches and logic-based systems. However, with the advent of more advanced computational capabilities and an exponential increase in data availability, the focus shifted towards machine learning (ML) and deep learning (DL) models. These models require substantial computational power and are responsible for the large demand for AI Computing.

Public and corporate interest in AI has erupted in the past few years, with more than 16% of companies in the Russell 3000 mentioning AI on earnings calls in 2023, up from just less than 1% in 2016[1].



In public markets, corporations within the AI/ML value chain have experienced tremendous increases in their market capitalization and profitability. GPU-maker NVIDIA made its way into the largest publicly traded companies in the US with its latest revenue and net income in 24Q2 was reported at $30.04B and $16.60B respectively, which was up 122%

[1] https://www.goldmansachs.com/intelligence/pages/ai-investment-forecast-to-approach-200-billion-globally-by-2025.html

and 168% year on year[2]. On the capital allocation end, significant amounts of funds were raised to move AI forward, with many AI startups valued at multi-billion-dollar valuations in the past year.

Looking beyond today, the trajectory of AI adoption seems to be exponential. A study on Global AI estimates that AI could contribute up to $15.7 trillion to the global economy in 2040[3], which is more than the current output of China and India combined. Another study report also estimates that the Global AI market size can grow to $2.7T by 2032 from $168.5B in 2022, marking a Compound Annual Growth Rate (CAGR) of 32.5% during the forecast period[4].

Current Landscape and Future Trajectory of AI Cloud Computing

In recent years, the field of AI has witnessed remarkable advancements, with Machine Learning (ML) emerging as one of the most prominent technologies in Applied AI. The various subfields of ML, such as Computer Vision, Natural Language Processing (NLP), Deep Reinforcement Learning, and Knowledge Graphs, have the potential to revolutionize numerous industries by eliminating redundancies, creating new content opportunities, and automating repetitive tasks.

As the demand for AI and ML continues to grow, cloud computing has become the go-to solution for training and deploying ML models due to its scalability and flexibility compared to traditional server farms. Startups and large corporations alike are increasingly adopting cloud services to integrate AI/ML features into their daily operations, leading to a surge in interest and demand for ML-focused cloud computing services.

The transformative impact of cloud computing on the economy is undeniable, as it has democratized access to advanced technology and levelled the playing field for businesses of all sizes. The pay-as-you-go model has made it easier for startups and small enterprises to leverage cutting-edge technology without significant upfront investments. Moreover, the ability to access data and applications remotely has facilitated the rise of remote work and collaboration, aligning with the evolving needs of the modern workforce.

[2] https://finance.yahoo.com/quote/NVDA/
[3] https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html
[4] https://finance.yahoo.com/news/global-artificial-intelligence-market-size-150000610.html

Beyond its economic impact, cloud computing has also brought about a profound shift in people's behaviour and mindset. The transition from owning physical hardware to using cloud services has fostered a mindset cantered on flexibility, innovation, and adaptability. This cloud-centric approach has encouraged collaboration and global connectivity, challenging traditional thinking patterns and promoting a proactive approach to problem-solving.

Looking ahead, the global AI Cloud Computing market is poised for exponential growth, with projections indicating a market size of USD 647.60 billion by 2030[5], registering a CAGR of 39.6% from 2023 to 2030. The demand for cloud computing, driven by major providers such as Amazon, Microsoft, Google, and Alibaba, is expected to continue its upward trajectory as enthusiasm for AI adoption grows. Many experts draw parallels between the current AI adoption and the gold rush, emphasizing the critical role of cloud computing as the "pickaxe" of this era.

As AI continues to advance and evolve, it is clear that AI Cloud Computing will play an increasingly crucial role in shaping the future of technology and business. The convergence of AI and cloud computing is poised to unlock unprecedented opportunities for innovation, efficiency, and growth across various industries, making it an exciting and transformative field to watch in the coming years.

Increasing Trend towards Democratizing AI

Moving forward, there is a growing trend in AI tools transitioning from proprietary, closed-source frameworks to a more open, accessible, and community-driven approach. The AI community has always built on the research and development of others to innovate. This shift is enabled by the integration of sophisticated, massively pre-trained models, advancements in cloud computing infrastructure, and the extensive availability of open-source resources. These developments collectively democratize access to cutting-edge AI technologies, enabling a diverse global audience to innovate, create, and contribute to the AI ecosystem.

One area where this is especially notable is in the realm of generative AI. The transition towards open-source frameworks has been particularly impactful. Open-source platforms and tools enable individuals and organizations to leverage powerful AI models for a variety of

[5] https://www.grandviewresearch.com/press-release/global-cloud-ai-market

applications, from content generation to complex problem-solving, without the prohibitive costs and restrictions often associated with proprietary software. This openness fosters a culture of collaboration and knowledge sharing, accelerating the pace of innovation and ensuring that advancements in AI benefit a wider community.

By 2026, over 80% of companies are expected to integrate generative AI technologies into their operations, using APIs, models, or deploying bespoke applications. This represents a significant leap from the less than 5% adoption rate in 2023[6], highlighting the rapid growth and acceptance of open-source AI solutions in the commercial sector. This trend is not confined to the tech industry alone; sectors ranging from healthcare to education and finance are beginning to harness the potential of open-source AI to transform their services, processes, and products. Additionally, the number of open-source AI projects on platforms like GitHub has seen exponential growth, indicating an increased collaborative effort in AI research and development.

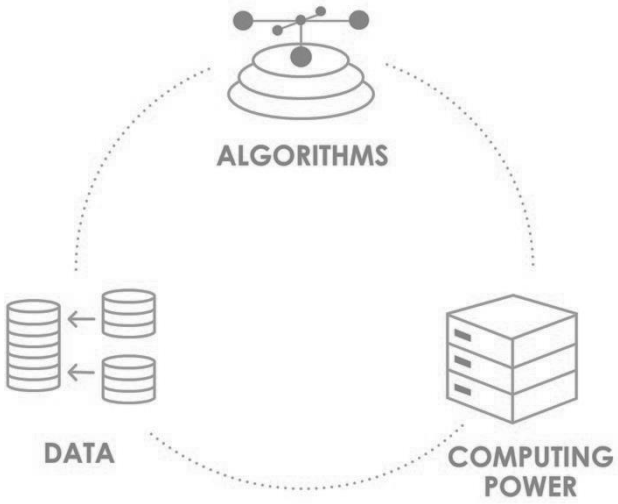
Moreover, the democratization of AI is further evidenced by the increasing availability of educational resources and training programs designed to make AI literacy more widespread. Universities, online platforms, and even AI companies themselves offer courses and workshops aimed at demystifying AI technologies and making them accessible to non-experts. This educational push complements the technical advancements, ensuring that the benefits of AI are not only widely available but also understandable and usable by a broad spectrum of society.

These developments collectively illustrate a concerted push towards making AI more accessible and inclusive. By democratizing the tools and knowledge required to harness the potential of AI, the global community ensures that the benefits of AI are not confined to a select few but are instead shared widely, fostering innovation, equity, and ethical advancement in technology.

[6] https://www.gartner.com/en/newsroom/press-releases/2023-10-11-gartner-says-more-than-80-percent-of-enterprises-will-have-used-generative-ai-apis-or-deployed-generative-ai-enabled-applications-by-2026

The three pillars of AI: Computation, Data and Algorithms

The trio of computation power, data, and algorithms acts as the powerhouse behind AI, each component playing a crucial role and working in tandem to advance AI capabilities.



Data, often referred to as the "fuel" for AI, is fundamental for training algorithms to recognize patterns, make informed decisions, and predict outcomes. Yet, its role extends beyond simple collection. Data must undergo detailed annotation and comprehensive preprocessing to be transformed into a structured format that algorithms can effectively process. This critical step of refining and organizing data ensures AI models can learn from high-quality, relevant information, enhancing their precision and effectiveness.

Algorithms stand as the intellect of AI, infusing machines with the capacity to learn from data. These algorithms, particularly through the advancements in deep learning, navigate through complex patterns, make autonomous decisions, and extract meaningful insights. The fusion of extensive datasets with surging computational power has significantly accelerated AI advancements, enabling algorithms, especially neural networks, to excel in diverse applications, from image and speech recognition to natural language processing and even autonomous driving.

Finally, central to the AI ecosystem is formidable computing power, serving as the backbone that supports both data processing and the execution of algorithms. This interdependence between computing capabilities and AI innovation is profound. As the digital era evolves and data generation escalates, the demand for stronger computing power intensifies, propelling the creation of more advanced processing units, GPUs, and AI-specific accelerators.

These developments are critical not just for achieving groundbreaking AI research and applications but also for sustaining the growing digital application landscape.

Together, computation power, data, and algorithms form an integrated framework, driving the progress and application of AI technologies in a synergistic manner.

Decentralized Physical Infrastructure (DePIN) as a solution to support AI Trends

In recent years, there has been increasing usage of DePIN technology to serve demand from existing and non-speculative sources. At its core, DePIN uses tokenization to coordinate and incentivize capital-intensive projects and presents an opportunity to disrupt traditional industries by leveraging on huge economies of scale. Through DePIN, individual contributors provide the necessary infrastructure for real users driving demand, while being rewarded for their contributions to the network infrastructure. DePIN technology has proven its potential to disrupt traditional industries by leveraging tokenization and decentralized networks, as demonstrated by successful projects in the renewable energy (Sun Exchange), cloud storage (Filecoin), and telecommunications (Helium) sectors. These examples showcase how DePIN enables individuals to contribute to and benefit from capital-intensive projects, creating more efficient, cost-effective, and accessible alternatives to established centralized systems.

In the DePIN model, individuals contribute to infrastructure development in a decentralized manner, receiving token incentives. This approach contrasts with the traditional method where corporations heavily invest in building and maintaining infrastructure. Web3 companies delegate these tasks to a token-motivated volunteer base, planning to monetize when coverage is sufficient. As infrastructure supply grows, it attracts builders, developers, and users, boosting demand. This increase in demand generates revenue for suppliers, creating a self-sustaining cycle, known as the DePIN flywheel[7].

DePIN is an effective solution that can serve the surge in AI Computing demand due to the following characteristics:

- **Fast Scaling and Cost Efficiencies**: DePIN allows infrastructure to be crowdsourced, allowing for the hyper scaling of projects at low costs through distribution among network

[7] https://messari.io/report/the-depin-sector-map

participants. Individuals looking for GPU infrastructure need not invest their own capital to procure GPU hardware, and GPU owners can fully utilize their GPUs and be compensated for it accordingly. This incentivisation mechanism results in fast-growing networks.

- **Sustainability of the Network**: In a DePIN network, individuals own and contribute to the network. This aligns the incentives of each network stakeholder. The entire community of node operators also governs operating procedures in a DePIN network, making the network less susceptible to corruption, hijacking and hacks.
- **Democratizing Access**: DePIN democratizes access to networks by creating networks that are open to everyone. Infrastructure that was previously inaccessible to GPU users due to the lack of scale or up-front capital costs are now accessible to them[8]. It is a shift from a monopolistic and centralized control model to a more democratized and distributed model, ensuring greater access, flexibility and transparency for users worldwide.

[8] https://www.nasdaq.com/articles/a-new-era-of-infrastructure:-the-rise-of-depin

Challenges Facing AI Computing

Within the AI Cloud Computing space today, the challenges which players in the ML development value chain face are multi-faceted, coming from both internal and external perspectives. On the internal front, the degree of centralization in today's cloud computing market poses tremendous risks to the technology infrastructure supporting the economy today. In addition, the exponential advancement of ML caused a need for higher GPU compute requirements, which the market cannot satisfy today, leading to higher prices for GPUs. Externally, geopolitical tensions further exacerbate the issues within the cloud computing space as restrictions on GPU supplies lead to further market inefficiency.

The Risk of Centralization

The current landscape for AI Cloud Computing is incredibly centralized, with services concentrated amongst big tech companies such as Amazon, Google, and Microsoft. While these companies host their server infrastructures across different geographies, central ownership and management of these servers poses threats to data privacy and security.

These issues are a key benefit for the adoption of decentralization in AI Computing, given the high degree of severity on the compliance and legal fronts that could arise from data breaches. Decentralized AI Compute is largely in-line with the efforts in campaigning towards more responsible AI practices, whereby Privacy, Safety and Security are the core elements in the eyes of ML academics and engineers.

Overall, centralization creates single points of failure and control, which can lead to censorship and monopoly, whereas decentralization empowers individuals by distributing power and promoting innovation through widespread participation.

Escalating GPU-compute Demands and Limited Access to Latest GPUs

The world's top supercomputers predominantly rely on GPUs for enterprise applications like AI, analytics, finance, manufacturing, and optimization due to the need for parallel processing in training and inference. The rise of complex AI models, especially large language models like GPT-4, has driven a doubling of computational requirements every few

months. This demand has spurred the development of specialized hardware like GPUs and TPUs tailored for efficient handling of such workloads, accentuating the necessity for more GPUs to meet these evolving needs.

However, current infrastructure faces challenges in keeping up with this demand, as the number of available GPUs in the market falls significantly short of what's needed. This discrepancy stems from factors such as high upfront capital costs, rapid GPU depreciation, and limitations on consumer-grade hardware usage by cloud providers. Achieving advancements in AI, particularly in LLMs, remains challenging, further exacerbating the GPU supply-demand gap and potentially impeding AI innovation for small to medium businesses amidst the ongoing chip shortage for latest models.

Users' Insufficient Comprehension of Computational Requirements

The rapid evolution of AI technology has led to a situation where there is a strong demand among users to acquire the latest GPU models. This trend is driven by various factors, including the perception that the latest models offer the best performance and efficiency for AI tasks. However, it's important to note that while some cutting-edge AI algorithms indeed require the most powerful computing capacity available, this is not always the case for every user.

Many users may not have a clear understanding of the computing power needed to effectively execute their tasks. The marketing and promotion surrounding new GPU releases inevitably creates a sense of urgency and desire among users to upgrade to the latest models. The rapid pace of advancements in AI technology also leads to the situation that users don’t have enough time to develop a comprehensive understanding of GPUs and their capabilities before new models are introduced to the market. As a result, users may end up purchasing GPUs with higher computing capacity than necessary for their specific tasks. This can lead to inefficiencies in resource utilization and unnecessary costs. Moreover, it can contribute to supply shortages and increased prices for the latest GPU models, creating challenges for users who genuinely require these high-performance GPUs for their AI workloads.

Political Tensions driving GPU Supply Constraints

Semiconductor production relies on a stack of complexities all piled on top of each other: mechanical, physical, chemical, logistical, and commercial. With the recent sanctions and restrictions between the US and China on exports of chips and chipmaking equipment, there is an air of uncertainty about the mid to long-term impact on the global GPU and AI cloud computing value chains. For example, the US has restricted Nvidia from selling their advanced chips to China. Such restrictions could add to the supply crunch that the world is experiencing today.

It remains to be seen how this situation can be resolved, but decentralization could have a huge part to play in empowering individuals, teams and corporations all over the world to contribute and gain access to more compute power without being susceptible to policy volatility.

Our Solution

Axlflops Network unique proposition lies in our decentralized computing platform which leverages the power of smart contracts on the blockchain to incentivize hosts to provide their AI computing capacity for our AI platform. By decentralizing and distributing the computational load across the network, the Axlflops Network effectively reduces the costs for small businesses and startups by up to 90%. At the same time, end-users have a new revenue stream where they can rent out their unused computing resources, thereby creating a self-sustaining ecosystem.

What we envision for the Axlflops network mirrors the model used by Uber but in the realm of AI computing. Here, sophisticated algorithms play a pivotal role in matching users with computing resource providers seamlessly. Just as Uber matches riders with drivers based on proximity and availability, our algorithms assess various factors to pair users with the most suitable computing capacity for their computing needs. These factors can include computational requirements, processing speed, memory specifications, and even geographical proximity to minimize latency.

Ultimately, Axlflops Network aims to democratize the AI ecosystem by creating a comprehensive full stack decentralized AI network solution. This is achieved through integrations and partnerships with decentralized algorithm projects and data projects. By fostering a collaborative environment that encourages the sharing of resources and expertise, Axlflops Network seeks to lower barriers to entry and facilitate innovation across the AI field. This approach ensures that the benefits of AI technology are accessible to a wider range of participants, promoting a more inclusive and equitable digital future.

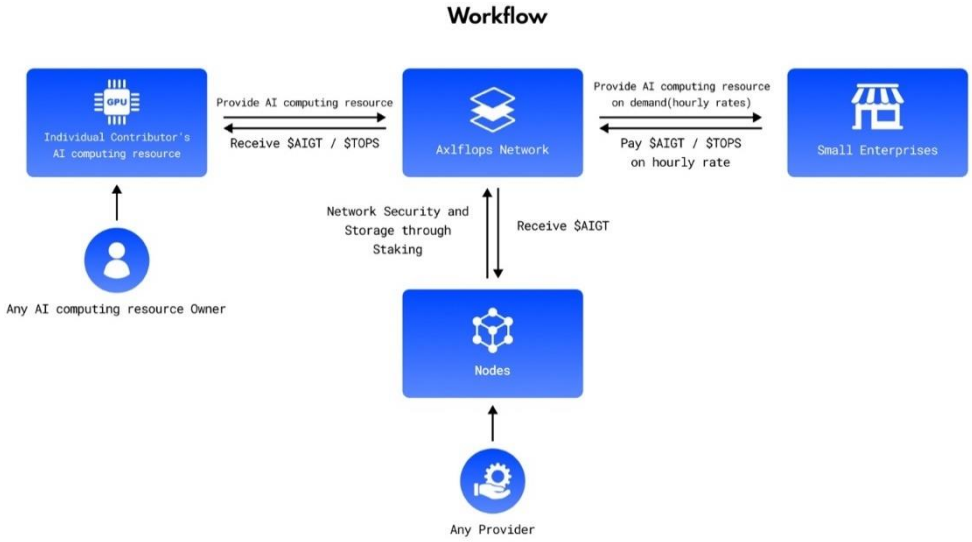
Much like how Uber optimizes transportation services, we aim to optimize AI computing resources. By leveraging advanced algorithms, we can create a dynamic and efficient marketplace where users can access computing power precisely when and where they need it. This model not only streamlines the process of accessing GPU resources but also ensures that users receive the best possible service tailored to their specific requirements.

Axlflops Network

Decentralized computing has the potential to revolutionize the way AI and ML is approached. Distributing computing tasks across multiple nodes harnesses the power of the collective to train larger, more accurate models and perform complex calculations more efficiently. This opens up new possibilities for innovation in fields such as natural language processing, computer vision, and autonomous systems.

The Axlflops Network pools and coordinates decentralized AI compute supply and demand using dual token model of $AIGT and $TOPS, providing exponentially greater AI computational capacity than what the centralized AI cloud offers. Through the running of the network, actors create economic efficiencies that make generative AI production viable and scalable for the first time. Both $AIGT and $TOPS serve as payment tokens allowing users and GPU Providers to participate in the network's computing power marketplace, while $AIGT additionally functions as the governance token enabling holders to participate in network decision-making and secure the ecosystem through staking mechanisms.

The Axlflops Network offers a promising solution to the pain points associated with the scarcity of AI computing capacities in the market. As demand for high-performance AI computing power intensifies, centralized supply chains struggle to keep up, resulting in shortages and inflated prices. However, while shortages in production occurs, it is not true that there are not enough GPUs in the world for AI/ML models to run on. In fact, over 85% of total GPU capacity sits idle[9]. This calls for a way to improve the efficiency of GPU usage, which can be done utilizing a market-based approach.



[9] https://towardsdatascience.com/the-hidden-world-of-gpu-inefficiency-776ae1c9cf5

The Axlflops Network, built on blockchain technology, empowers individuals and organizations to contribute their idle AI computing resources to a distributed network. This collective sharing of computational power not only optimizes AI computing utilization but also creates a more resilient and efficient ecosystem. Users in need of AI computing resources can access them from the decentralized network, mitigating shortages and reducing dependency on a few suppliers. Furthermore, the Axlflops Network is not only compatible with all GPUs and other AI accelerators, but will invite the participation of all vendors and architectures including non-Nvidia GPUs such as AMD Radeon and Intel Arc.

Decentralized computing leverages smart contracts to automate resource allocation, ensuring fair compensation for contributors and creating a transparent, permissionless environment. This collaborative and decentralized approach not only addresses the immediate challenges of AI computational power scarcity but also fosters a more democratized and sustainable model for accessing high-performance computing resources.

Apart from developing a decentralized AI compute network that connects AI computing power providers with users through a peer-to-peer system, the Axlflops Network will also provide integrations with decentralized algorithm projects and data projects to maintain integrity and accessibility, providing for a full stack AI ready network. By doing so, Axlflops Network aims to democratize the AI ecosystem, making it decentralized and resilient against single points of failure. This system allows for open participation, encouraging innovation by letting individuals and organizations contribute algorithms and share data freely. The overarching goal of Axlflops Network is to create a decentralized, robust AI ecosystem that fosters collaboration and innovation without reliance on centralized control.

GPU Pooling for Enhanced Computing Capacity and Accessibility

We are introducing the concept of computing capacity pooling as a strategy to optimize the utilization of existing GPU capacity. Recognizing that many GPUs experience idle periods when they are not engaged in primary tasks, we aim to leverage these downtime windows by aggregating their computing capacity into our pooling system. For instance, certain GPUs may remain inactive after work hours in one part of the world, while in another region, labs are actively working during that time. By synchronizing these idle periods with active demand elsewhere, we can efficiently enhance the overall network performance. Consider another

scenario in game design and rendering where multiple studios collaborate on a project with varying work schedules and computational demands. Traditionally, each studio would operate its own set of GPUs, leading to inefficiencies during periods of downtime. However, with GPU pooling, idle GPUs from one studio can seamlessly contribute their computing power to assist another studio that is actively engaged in rendering or processing complex game elements.

More importantly, this pooling approach significantly expands the accessibility of robust computing resources to a broader range of users. This initiative not only boosts the efficiency of GPU utilization but also democratizes access to high-quality computing resources, fostering innovation and collaboration on a global scale.

Optimized Algorithmic Alignment of Users' Computing Needs

Nowadays, there exists a wealth of GPU resources that remain underutilized. This underutilization stems from a common challenge: users often lack a clear understanding of their specific computational needs for their tasks. Consequently, they may opt to pursue the latest GPU models, believing that investing in cutting-edge technology will guarantee the successful completion of their tasks. However, this pursuit of the newest models often comes at a premium cost, resulting in users paying more than necessary for computing resources. This cycle perpetuates the inefficiency of resource allocation, as users prioritize novelty over practicality, leading to an imbalance between resource availability and utilization in the market.

To tackle this challenge, we have implemented an algorithmic solution aimed at assisting our users in evaluating their workload and identifying the most suitable computing resources. This algorithm leverages a comprehensive analysis of users' tasks, considering factors such as computational intensity, memory requirements, and processing speed. By accurately assessing these parameters, the algorithm can recommend the most optimal computing resources from the available pool, thereby minimizing the need for users to rely solely on the latest models or pay unnecessary premiums. This approach not only streamlines the resource allocation process but also ensures that users obtain the computing power they need at the most cost-effective rate, fostering a more efficient and equitable utilization of GPU resources in the market.

Enhanced Allocation System for Optimized Supply-Demand Matching

We are implementing several strategies to optimize the costs associated with computing resources. Firstly, we are introducing a task-staggering approach, where computing tasks are scheduled in a way that leverages idle capacities effectively, thereby reducing costs for users. Additionally, we will continuously monitor the availability of computing resources and dynamically reassign them to users if more cost-efficient capacities become accessible.

Additionally, we are implementing incentives through our tokenomics model, focusing on our $AIGT and $TOPS. Participants within the network will be rewarded as involved contributors, earning $AIGT tokens based on their engagement and contributions. Several months after the initial $AIGT introduction, holders will begin receiving $TOPS through a monthly mapping process at a fixed 1:0.5 ratio, creating an additional incentive layer within the ecosystem. This incentivized framework not only encourages active involvement but also cultivates a mutually beneficial relationship between participants and the network, enhancing both efficiency and affordability in resource access. Further details regarding the functionality of the dual-token model will be elaborated upon in the tokenomics section.

Built on Solana

We will be launching Axlflops Network on Solana due to the following advantages that Solana offers to a large scale DePIN project like us:

- **High Transaction Throughput and Low Costs:**

Solana offers high Transactions per Second (TPS) due to Proof of History (POH) and parallel processing abilities is essential for meeting scaling needs of DePIN project. Axlflops can store data on-chain easily without complicating on-chain processes. With the upcoming Firedancer update in 2024, Solana can scale its TPS to 1 million[10], meeting the demands of large-scale DePIN projects like Axlflops Network.

Solana's appeal also lies in its lower transaction fees, attributed to a local fee market that avoids global congestion. This aspect is crucial, considering transaction costs could surpass the compute work expenses. Transaction fees cost less than $0.001 on Solana on average. Additionally, in scenarios without priority fees, costs incurred are expected to drop much more

[10] https://members.delphidigital.io/reports/solana-the-monolith

significantly.

- **Performance and Flexibility:**

DePIN networks usually requires dynamic, real-time state updates on-chain. Solana's compatibility with Rust programming language offers greater speed and flexibility than Solidity, allowing the same codebase to be used for both GPU work and smart contracts.

- **Future Scalability for Data-Intensive Applications:**

Solana’s superior TPS and efficient data handling capabilities are crucial for scaling up, particularly for applications like token gated streaming, real-time gaming, and micro-asset economies that require extensive data tokenization.

- **Liquidity and Uptime Considerations:**

While Solana has faced challenges with uptime in the past, its performance improvements in recent years with the shift to Stake Weighted Quality of Service (prioritization of transaction based on stake percentage for network efficiency to reduce bandwidth load on leader’s network), Local Fee Markets (switch from first come first serve to additional priority fee based approach without affecting global network), QUIC (communication protocol to mitigate spam/abusive/DDOS behaviour) has helped to reduce the occurrence of outages and achieve close to 100% uptime.

Additionally, Solana's presence on major cryptocurrency exchanges supports liquidity for any DePIN token that will be launched under Solana token (SPL) framework.

In summary, Solana's high-performance capabilities, lower transaction costs, scalability for data-intensive applications, robust developer community, security features, and network decentralization make it an ideal choice for Axlflops Network to launch into initially.

Technology Edge of Axlflops Network

Supply-Demand Matching System

In the context of the technology stack design, ensuring the quality and reliability of work involves implementing robust mechanisms and strategies. Our objective is to allocate tasks while considering factors such as quality, complexity, cost, and other variables within a diverse workload environment. We overcome several practical issues to make the proposed algorithm effective in large-scale systems, including computational efficiency, multi-goal optimization, and balancing the tradeoff between user experience and platform efficiency.

Greedy Algorithm

Decentralized AI computing methods, akin to Uber's dispatch system, usher in a new era of resource allocation strategies. In line with this concept, our approach integrates a greedy algorithm as the foundational principle for managing computing resource supply and demand. Tasks are segmented into three distinct scenarios for classification:

- Priority is given to dispatch tasks to the same computing capacity provider within the same region, adhering to the greedy method's core tenet.
- In cases where the suitable provider is not available or the task cannot be completed by a single provider, the system endeavors to identify the nearest computing capacity provider.
- Only if the above scenarios are unsuccessful, the task is assigned to different providers across various regions.

This decentralized methodology optimizes the use of distributed computing power while minimizing latency. By leveraging real-time data and decentralized algorithms, users gain access to the closest and most suitable computing resources for their tasks. This results in enhanced performance and increased system efficiency within decentralized AI computing environments.

Adaptive Dynamic Allocation Algorithm

In addition to the greedy algorithm, our system will enhance its dispatch algorithms by incorporating a Random Neural Network (RNN)-based scheme. This scheme utilizes reinforcement learning with a numerically defined goal function. The network will make decisions based on real-time and updated measurements, learning from completed tasks regarding the general task complexity, estimated completion time, and the most suitable GPU

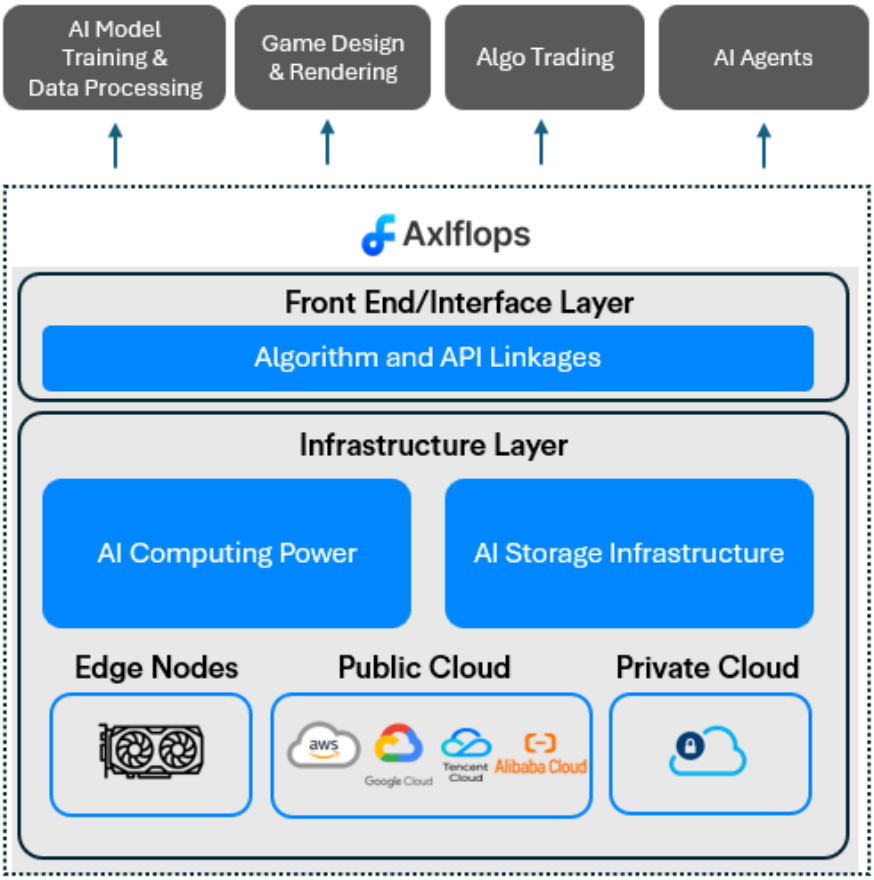
model for the task. This approach allows for dynamic and adaptive task dispatching, optimizing resource allocation and improving overall system efficiency in AI computing environments.

Task-grabbing Scheme

With our enhanced algorithms, we are introducing another approach for GPU providers to actively grab tasks. Under this scheme, the system first selects a set of GPU providers and broadcasts computing requests to these providers. Each request includes the computing resources required and the estimated completion time of the task. Sensitive information related to the task, such as its value and content, is blocked during this process. This approach allows multiple GPU providers to evaluate a request simultaneously, reducing task waiting times and improving overall network efficiency.

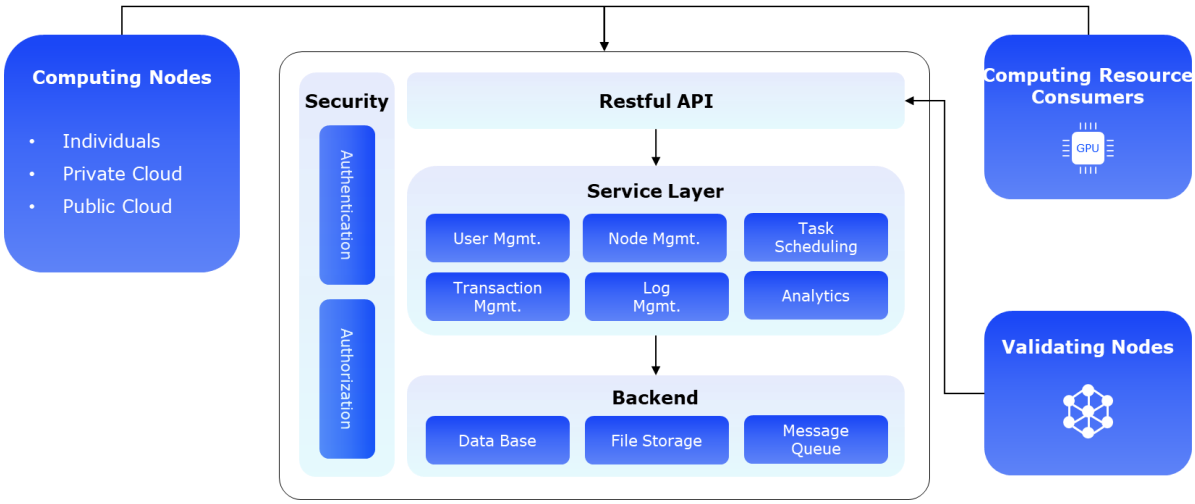
GPU Pooling Architecture Structure

At a high-level overview, the network architecture of Axlflops can be divided into two primary layers: the Infrastructure Layer and the Front-End Layer.



The computing power and storage infrastructure form the core of the Axlflops Network's infrastructure layer. This layer consolidates contributions from AI computing providers, who pool together their computing nodes from public clouds, private clouds, or edge nodes.

The front-end layer is built around the Axlflops' algorithm, which facilitates resource allocation by matching demand with the appropriate supply. This layer is driven by our API linkages, creating a front-end platform that enables dApps to leverage various use cases, from AI model training to game design and algorithmic trading.



Multitier Architecture

The architecture of Axlflops is a multitier, cohesive structure designed to deliver a streamlined, secure and efficient user experience. Each tier possesses distinct responsibilities and collaborates closely with each other to guarantee optimal system performance. Additionally, this architecture leverages modern, widely adopted technologies to guarantee high availability.

- **RESTful API**

The RESTful API tier serves as the main interface for external communication, allowing consumers and nodes to interact with the Axlflops Network. Through this API, consumers can request resources, and nodes can onboard and manage their resources. It exposes endpoints for various actions like resource provisioning, usage monitoring, and task management.

- **Service Tier**

The Service tier consists of core service modules managing the functionalities of Axlflops:

User Management: Handles user registration, profile management, and user-related configurations.

Node Management: Manages the provisioning, monitoring, and status updates of computing nodes.

Task Scheduling: Schedules and orchestrates tasks across the distributed resources, balancing loads and optimizing resource utilization.

Transaction Management: Handles payment and credit allocation between resource providers and consumers, tracking usage and billing.

Log Management: Collects and organizes logs from various components, enabling monitoring and troubleshooting.

Analytics: Provides analytics and insights on resource usage, performance metrics, and user patterns.

- **Backend**

Database: Stores user, node, and transaction data securely and allows efficient querying for fast response times.

File Storage: Stores files and datasets that may be required by tasks running on the nodes.

Message Queue: Manages asynchronous communication between services, helping to decouple and scale various parts of the architecture.

- **Security**

The security module ensures that only authorized users and nodes can access and utilize the resources on the Axlflops Network. Authentication verifies the identity of users and nodes, while authorization manages access control based on user roles and permissions.

- **Computing Nodes**

These are the computing resource providers in the Axlflops Network, which can be owned by individual users, private clouds, or public clouds. These nodes contribute their computing resources to the network for consumption.

- **Computing Resource Consumers**

These are the consumers that utilize the computing resources provided by the computing nodes. Through the RESTful API, consumers can request computing resources, perform computations, and retrieve results.

- **Validating Nodes**

The validating nodes ensure the integrity and reliability of the Axlflops Network by validating computing nodes' availability status and computing task execution results as part of a decentralized validation process.

Use Cases

Axlflops Network's primary objective is to establish a robust, decentralized platform dedicated to AI computing capacity. This platform is designed to attract a wide user base and provide the ideal environment for developers to efficiently leverage and tap upon to power and drive usage of their applications, software, or models.

To accomplish this goal, Axlflops Network intends to grant developers straightforward access to AI computing resources, along with extensive documentation and tools that are conducive to development to foster a diverse ecosystem. Tapping into the Axlflops Network platform unlocks a plethora of potential applications, each benefiting from both the substantial AI compute resources available and a robust ecosystem. Here are some applications that can benefit from deploying on the Axlflops Network:

Large Language Model (LLM) and Large Action Model (LAM)

Axlflops Network serves as an ideal foundation for developers aiming to train complex and sophisticated AI models, including LLM and LAM. This network is designed to democratize access to high-caliber AI research, making it significantly more feasible for developers to embark on projects involving complex data analysis, predictive modeling, and the creation of dApps that demand real-time data processing.

Additionally, Axlflops Network's infrastructure is optimally configured for scalability and efficiency, ensuring that applications ranging from large-scale data analysis to AI-driven predictive models operate seamlessly and with unprecedented speed. This makes our network an indispensable tool for those looking to harness the power of AI technology to drive advancements and achieve breakthroughs in a variety of fields.

Game Design & Rendering

For applications requiring top-tier 3D rendering—such as architectural visualizations, virtual reality (VR) experiences, or game development—Axlflops Network's AI computing resources is able to significantly streamline the rendering process. Game developers can gain access to scalable computing power that boosts the efficiency of graphics rendering, markedly reducing the time and cost associated with game production. This breakthrough enables smaller studios to create games featuring high-quality graphics that were once the exclusive domain of larger companies, effectively democratizing the gaming industry.

In leveraging the Axlflops Network, developers and creators not only benefit from reduced production times and costs but also from the opportunity to innovate and compete at a level playing field. It's a transformative tool that equips a broader range of creators with the resources to push the boundaries of what's possible in 3D rendering and AI-driven applications.

AI Agent

AI Agents can be deployed on the Axlflops Network which introduces a novel AI-centric approach to blockchain technology, making it a pivotal AI coprocessor for the development of smarter, more responsive dApps and automation. This innovation not only facilitates the creation of AI agents that are modular and interoperable—essential for building complex systems capable of diverse automated tasks based on users input—but also pioneers a decentralized marketplace for the trading and utilization of AI agents. Such a marketplace democratizes access to AI technologies and fosters a culture of innovation.

For example, AI Agents like Smart Contract Code Helper can be a part of the Axlflops ecosystem aiding developers in crafting more efficient, secure, and reliable smart contracts, streamlining the development process, reducing errors, and improving the functionality of decentralized applications. With comprehensive documentation and developer-friendly tools, the Axlflops Network is well-positioned to attract a wide array of developers and projects, creating a vibrant ecosystem that drives demand for $AIGT tokens and enhances the network's value.

Algorithm Trading

Algorithmic trading relies crucially on the ability to process and analyze data in real-time for making informed trading decisions. Axlflops Network, with its high-speed computational capabilities, stands as a vital resource for algorithm traders. It provides the necessary power to sift through vast datasets and execute trades at the most opportune moments, thereby potentially enhancing profitability and efficiency within the volatile DeFi markets.

Powered by the Axlflops Network, AI algorithms can autonomously analyze market data and execute trades based on predefined criteria, allowing DeFi traders to capitalize on profitable opportunities without direct human involvement. This not only streamlines the trading process but does so cost-effectively, making sophisticated trading strategies more accessible to a wider audience.

Tokenomics

Axlflops Network is implementing a comprehensive token ecosystem comprising two main tokens to optimize token utility. Under the tokenomics, Axlflops Network will operate with a dual-token model consisting of $AIGT and $TOPS. The total supply of $AIGT is capped at 710,000,000 tokens, while $TOPS has a total supply of 71,000,000,000 tokens. $AIGT, will initially be the only token distributed, serving multiple functions including payment, rewards, staking, and governance. On the other hand, after several months of $AIGT introduction, $TOPS will be introduced through a mapping mechanism.

The initial mapping of the two tokens is set at a ratio of 1:0.5 monthly, which means that early adopters of $AIGT will have the opportunity to receive $TOPS based on their average token holdings since the previous mapping. This mapping process will continue for approximately 18 years and 3 months until all 71 billion $TOPS are fully introduced. Such a mapping timeline is specifically designed to align with the $AIGT Reward period of 15.5 years, ensuring long-term network stability through continuous GPU Provider incentivization.

Through our dual-token model, we aim to incentivize both existing and new users to contribute resources. Users are rewarded for active participation in Axlflops, regardless of whether they are computing resource providers or computing capacity users. In certain instances, users may access resources at no cost due to the rewards exceeding associated costs.

$AIGT

$AIGT is meticulously designed with a capped total supply of 710,000,000 tokens to underpin its value and scarcity. This supply limitation safeguards against inflationary pressures, ensuring the token's purchasing power and appeal as a medium of exchange within the ecosystem. The fixed supply acts as a fundamental economic principle, establishing a stable foundation for the market dynamics, facilitating predictable and sustainable growth. To ensure controlled market distribution, $AIGT establishes a phased token availability framework spanning 90 days, with 25% of tokens released at launch, followed by additional 25% releases at each 30-day interval (30, 60, and 90 days).

Payment Function

$AIGT serves as a main payment token initially within the Axlflops Network ecosystem to realize a self-sufficient economic cycle. End users can use $AIGT to purchase computing

power directly, while GPU Providers receive $AIGT as compensation by executing tasks. This payment mechanism incurs a platform service fee of 0.2% from both participants – added to the total rental cost for End Users and deducted from computing rewards for GPU Providers. Such a fee structure is designed to be dynamically adjusted based on market conditions, ensuring sustainable platform operations.

Governance Mechanism

$AIGT serves as a governance tool in Axlflops Network, empowering its holders with the right to partake in the network's governance processes. This participatory model democratizes decision-making, allowing token holders to vote on critical aspects of the network's operation and development, such as the inclusion of new AI models and adjustments to network protocols. This mechanism ensures that the evolution of the Axlflops Network is guided by its community, aligning with the decentralized ethos of blockchain technology. Through this governance framework, $AIGT holders directly influence the network's strategic direction, fostering a collaborative environment where stakeholders' voices are heard and valued.

Staking Feature for Network Security

One of the standout features of $AIGT is its staking mechanism, which offers multiple benefits to the network and its participants.

Token holders can stake their $AIGT to support the network's security, particularly through validating nodes. Stakers contribute to the robustness and integrity of the network, helping secure transactions and data. In return for their commitment and contribution to the network’s security, stakers earn rewards, creating a compelling incentive to hold and stake the token. This staking mechanism enhances the network's security and decentralization, as more participants are incentivized to actively engage in maintaining the network's health and stability.

Computing provider can stake $AIGT to match their contribution to the network. The tasks completed by computing provider in the network and the rewards they receive are related to the amount of the stake they hold. Therefore, computing provider can prove their identity and willingness to participate in the network by staking a certain amount of $AIGT. At the same time, staking can prevent malicious behaviours by computing provider, such as attacking the network, double spending, etc., thus ensuring the security and stability of the network. In short, the staking mechanism can promote computing provider to actively participate in the construction of the Axlflops Network and continue to make contributions.

Incentives for Usage of Network and Ecosystem Participation

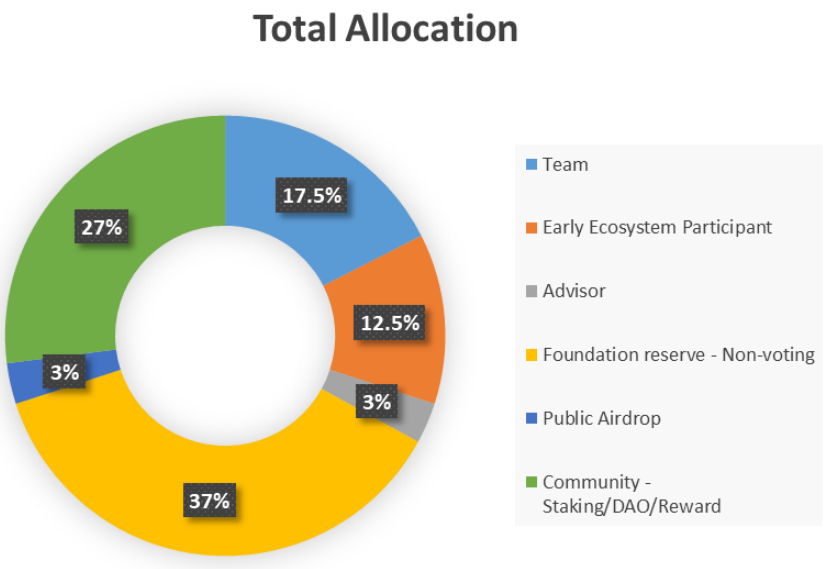
By contributing AI computing capacity as network nodes and maintaining network stability, GPU Providers play a crucial role in the Axlflops ecosystem and are rewarded with $AIGT for their valuable contributions. Similarly, users are incentivized with rewards for their usage of the network. $AIGT is also used to incentivize participants in the ecosystem, whether they are AI computing capacity contributors, network users. This is achieved by rewarding their contributions through airdrops and various forms of incentives.

Network Value Accrual

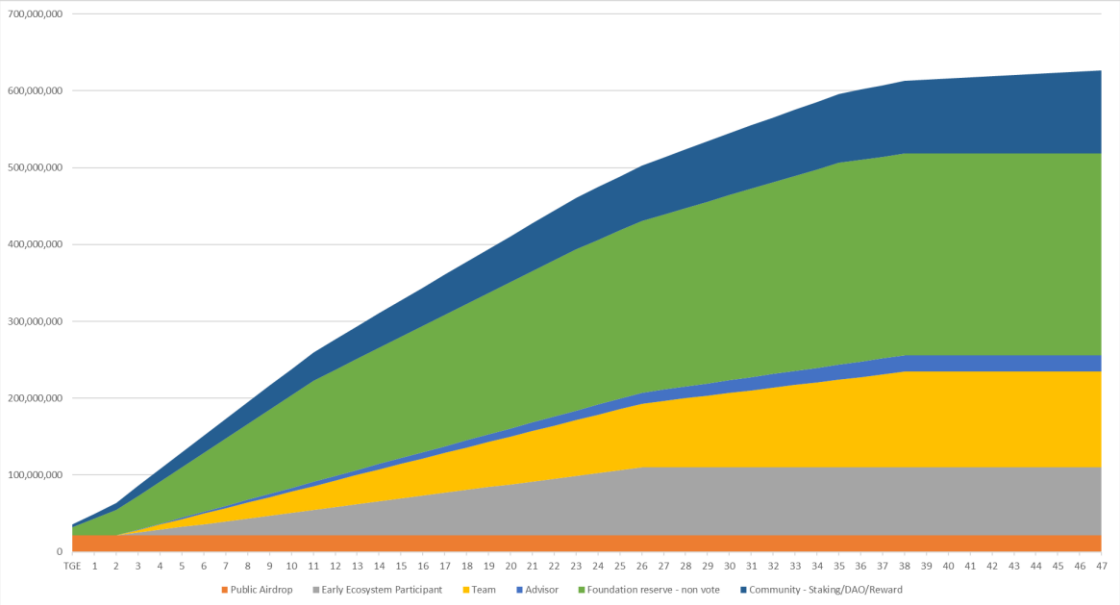
$AIGT plays a crucial role in accruing the network's value. As the Axlflops Network expands and attracts more users, the demand for $AIGT is expected to increase, driving up its value. Token holders benefit from this network value accrual, as the appreciation in the token's value reflects the network's success and the utility it provides. This creates a virtuous cycle, where the incentives for holding and staking $AIGT align with the goals of enhancing network security, governance participation, and overall ecosystem growth. Through this design, $AIGT serves as a foundational element of the Axlflops Network, integrating governance, security, and economic incentives to foster a thriving and resilient ecosystem.

Token Distribution

The token allocation for the supply of $AIGT Token will be distributed based on the chart below:



- The Public Airdrop will be fully available at Token Generation Event (TGE).
- The Foundation Reserve (Non-voting) allocations will be available over 36 months starting from TGE.
- The community allocations will be available over 15.5 years starting from TGE.
- All other token allocations will be available starting from TGE + 3 Months:
    - The Team and Advisor allocations will be available over 36 months post-TGE as compensation for services they provide.
    - The Early Ecosystem Participant allocations will be available over 24 months post-TGE as compensation for their work and support of the ecosystem by Early Ecosystem Participants.
- The following chart is a visualization of the token availability and utilization schedule:



$TOPS

$TOPS is designed to enhance user incentives and enrich the platform's payment mechanisms. With a capped supply of 71,000,000,000, $TOPS ensures a finite availability, aligning with principles of scarcity and value retention commonly seen in successful digital assets. This supply cap is a critical element in the token's economic design, aiming to prevent inflationary pressures and maintain the token's purchasing power over time. The decision to

cap the supply is a strategic move, emphasizing the project's commitment to establishing a stable and sustainable economy within the ecosystem.

Under Axlflops tokenomics, $TOPS is positioned as an additional enabler of decentralized computing in addition to $AIGT, effectively bridging the gap between supply and demand in the AI computing power market.

Token distribution

The token allocation for the supply of $TOPS Token is distributed through a special approach:

$TOPS will be exclusively distributed through a monthly mapping mechanism that begins several months after the initial $AIGT issuance. This mapping process will follow a fixed ratio of 1:0.5 ($AIGT:$TOPS), where distribution is determined by the average $AIGT holdings in each address since the previous mapping event.

Furthermore, $TOPS abandons the traditional token distribution model that typically includes separate allocations for team members, investors, advisors, and foundation reserves. Instead, all tokens will be distributed through the mapping mechanism to create a more equitable and transparent distribution system. This distribution will continue for approximately 18 years and 3 months, aligning with $AIGT's 15.5-year reward period.

Token for Transactions

$TOPS also serves as a trading token, leveraging the User Leasing Model to facilitate transactions for AI computing utilization. This model serves as a transactional medium in addition to $AIGT for both consumers and providers of computational resources, empowering users to acquire the processing power they need using $TOPS. By leveraging $TOPS as a transactional currency, the platform ensures a more seamless and efficient mechanism for accessing and providing AI computing resources, fostering a more accessible and flexible computing environment.

The economic model designed for $TOPS facilitates a direct and fair exchange between users seeking AI computing power and contributors offering this valuable resource as well. Users in need of AI capabilities for their computing tasks remunerate these services using $TOPS, creating a consistent demand for the token. Conversely, AI computing power contributors, who offer their unused processing power to the network, are compensated in $TOPS for their contributions. This reciprocal relationship not only underpins the token's

utility but also fosters a vibrant ecosystem where contributors are incentivized to share their resources, and users can efficiently access tailored computing power to fulfill their requirements.

Meanwhile, $TOPS will also charge a dynamic service fee 0.2% similar to $AIGT to support the operation of the Axlflops platform.

Token for Voting Rewards

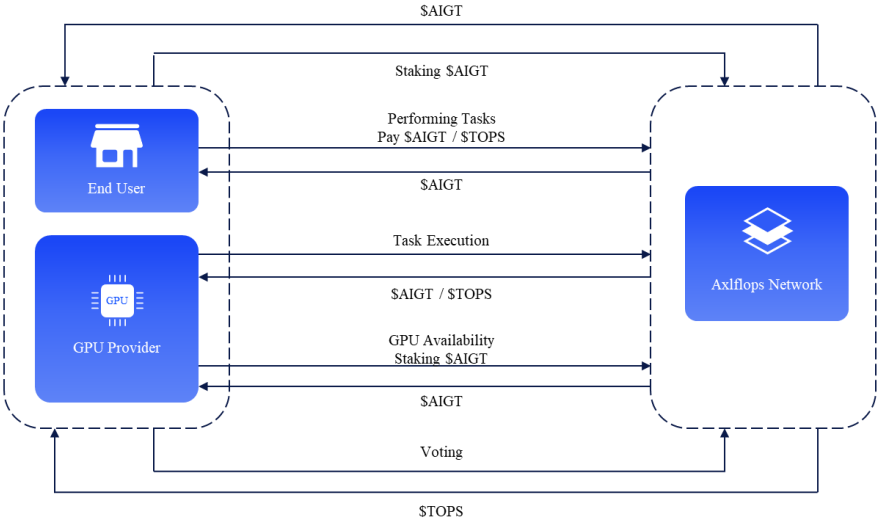
The governance mechanism in Axlflops Network introduces an additional method for $TOPS acquisition through active participation in network governance. $AIGT holders who engage in the platform's voting processes are rewarded with TOPS tokens, creating a direct incentive for community participation in critical decision-making. This voting reward system compensates token holders who actively contribute to the network's governance are for their engagement, promoting a more dynamic and participatory ecosystem.

Dual Token Interaction

The Axlflops implements a comprehensive dual-token model where $AIGT and $TOPS interact to create a sustainable economic ecosystem. End Users have the flexibility to purchase computing power using either $AIGT or $TOPS, while GPU Providers receive earnings in their choice of either token. This dual payment method enhances liquidity and user choice within the ecosystem.

The interaction between the two tokens is primarily facilitated through several key mechanisms:

- The monthly mapping process, where $AIGT is distributed to $TOPS holders at a 1:0.5 ratio, beginning several months after $AIGT's initial issuance
- The voting rewards of $AIGT holders, a compensation of $TOPS for the community voting participation.


$AIGT
Staking $AIGT
Performing Tasks
Pay $AIGT / $TOPS
End User
$AIGT
Task Execution
GPU
GPU Provider
$AIGT / $TOPS
Axlflops Network
GPU Availability
Staking $AIGT
$AIGT
Voting
$TOPS

Roadmap

Phase I: Democratize AI Computing with a Sustainable Dual-Token Model on Solana

In the initial phase of Axlflops, we aim to create robust computing infrastructure leveraging the advantages of Solana. We will build our platform step by step to streamline our user's AI computing experience on a throughput and cost basis while ensuring the highest degree of data privacy and security. Axlflops holds the vision to help users utilize the existing AI computing resources and make AI computation accessible for a broader group of users.

With our sophisticated dual-token model, Axlflops introduces a variety of incentive mechanisms for both the GPU providers and users. We design the interaction schemes between the governance and utility token with the idea that participants will all benefit from the sustainable development of Axlflops. We want to create a win-win platrform for all participants. Our objective is to ensure that the Axlflops Network as a protocol can run sustainably in the long run with the right incentive loops in mind, allowing users to gain permissionless access to compute.

Additionally, we will put in place robust a confidential computing strategy to ensure the privacy and security of sensitive data. By leveraging trusted execution environments and secure enclaves, the Axlflops Network will allow for the processing of data in a protected, isolated environment, shielding it from unauthorized access, tampering, or disclosure.

Phase II: Enhance Axlflops with Introduction of New Blockchain Protocol

In the second phase, Axlflops envisions introducing a new blockchain infrastructure specifically tailored to optimize DePIN and democratize AI computing. This entails designing a decentralized structure that empowers users by providing transparent, secure, and accessible AI computing capabilities. Our goal is to enable a wider range of participants to engage in AI-related activities, fostering innovation, collaboration, and equitable access to computational resources across various industries and applications.

It will be designed to facilitate seamless transactions with high throughput and low transaction fees., ensuring compatibility and interoperability across different blockchain

networks. This interoperability will enhance the usability and flexibility of our platform, allowing users to leverage diverse blockchain ecosystems for AI computing tasks while maintaining a high level of security and efficiency.

Furthermore, we will continuously introduce additional incentives to encourage active participation and engagement within our ecosystem. These incentives will be designed to reward partcipants for their contributions, fostering a vibrant and thriving community around democratized AI computing.

Future Plans: Build a Decentralized and Antifragile AI Ecosystem

Going forward, the ultimate aim of Axlflops is to revisit the Core Trio of AI: Computation, Data, and Algorithms. While we begin with a focus on computation, we do not intend to limit ourselves solely to this aspect. Concurrently, we plan to integrate with other decentralized algorithm projects and decentralized data platforms to ensure the integrity and accessibility of algorithms and data across the network.

The overarching goal is to democratize the entire AI ecosystem, transforming it into a decentralized and antifragile system. This means individuals and organizations can participate without encountering barriers, contributing algorithms and accessing shared data. This approach encourages innovation and resilience, as the system is not reliant on any single point of control or failure.

In summary, by intertwining decentralized computing power with algorithm and data decentralization, our vision is to create a democratized, decentralized, and antifragile AI ecosystem.

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