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AI Power Grid Whitepaper

> **Note:** This whitepaper was written during AIPG's original Ravencoin-fork era. The project has since migrated to **Base L2** with a new architecture. The vision and principles remain the same, but the technical implementation has evolved. See The Grid for current architecture.

Abstract

AI Power Grid (AIPG) stands at the intersection of blockchain and artificial intelligence, aiming to make open-source AI technology more accessible and more rewarding for the community. Beginning as a Ravencoin fork, AIPG initially adopts a Proof of Work (PoW) model to attract GPU miners and then later transitions to a Proof of Useful Work (PoUW) framework, which will allow these miners to evolve into node operators that will host and manage local AI workloads.

AI Power Grid aims to provide real-world artificial intelligence (AI) services, such as local Large Language Models (LLM) inference and Stable Diffusion image generation, at absolutely no cost for community use. There will also be a paid version that provides users with a higher tier secured and trusted node along with API access for integrations.

AIPG is designed to fuel innovation in open-source AI, offering a platform for enthusiasts to experiment, build, and contribute, thereby democratizing AI technology and helping pioneer the next era of open-source AI advancements.

Background

AIPG originated from a grassroots movement with a clear vision: to democratize access to AI and galvanize open-source AI initiatives. We firmly believe in the democratization of AI, ensuring its vast potential is not restricted to a select few but made accessible to everyone.

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AIPG was developed as a fork of the Ravencoin, chosen for its PoW model and ASIC resistance. This decision was made primarily to recruit GPU miners and help them transition to the PoUW model. During this phase, development will continue towards nodes and hosting AI workloads.

AIPG envisions expanding its capacity to accommodate diverse AI workloads in the future and even communication between AI workloads, such as using image generation tools from an LLM, or creating a Mixture of Experts system that is capable of complex tasks. The journey of AIPG is a testament to a dedicated team of developers who are driven by a mission to pave the way for a balanced and sustainable AI ecosystem.

The AI Power Grid Protocol

The AI Power Grid protocol is an innovative system designed to democratize open-source AI. AIPG is built on the principles of fairness, transparency, and decentralization, with an initial foundation on the ASIC-resistant KawPoW algorithm during the PoW period. This choice ensures a fair launch and encourages widespread participation from GPU miners, laying the groundwork for a future where AI is accessible to all.

A significant evolution in the protocol is the transition to the PoUW system. In this setup, miners' computational resources are devoted to tangible tasks, predominantly hosting local LLM and other predominant AI workloads like Stable Diffusion XL. With expansion to other AI workloads as the network matures. Integral to the PoUW system is the role of "validator" nodes. These specialized nodes employ a consensus algorithm to authenticate the accuracy and integrity of LLM inference and other tasks conducted by nodes. Utilizing cryptographic verification and cross-referencing, the validators mitigate the risk of data manipulation and ensure honest reporting of computational contributions.

To strengthen the trustworthiness and commitment of these validators, a Proof-of-Stake (PoS) mechanism is in place. Validator nodes are required to hold a minimum of approximately 10,000 AIPG coins, ensuring their vested interest in the network's success and integrity.

The AI Power Grid Economic Model

AIPG introduces a sustainable and balanced economic model. Initially, the protocol capitalizes on a PoW mechanism, initially granting miners a block reward of 500 AIPG coins for every block. With a block time set at 1 minute, it ensures the efficient and timely processing of transactions. As AIPG evolves, transitioning to the PoUW system and the associated PoS mechanisms, there will be a phased reduction in block rewards to encourage early adoption and active participation. This gradual decline will continue until the total coin supply nears its 150 million coin cap (see the Tokenomics webpage for supply and halvening updates made since Mainnet launch).

To champion the ongoing development, innovation, and maintenance of the network, a 5% reward from every mined block will be reserved for the operations wallet. These funds are pivotal in driving

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the continuous growth and evolution of the AI Power Grid ecosystem. AIPG's economic model is structured to ensure fairness and inclusivity. It emphasizes rewarding early adopters while laying the foundation for sustainable growth.

Initial AIPG Tokenomics Summary

- **Symbol**: AIPG
- **Block Reward**: 15.652 AIPG
- **Block Time**: Approximately 1 minute
- **Maximum Supply**: 150 million AIPG

Transition to Proof of Useful Work (PoUW)

AIPG's planned progression from the conventional PoW to our innovative PoUW represents a reimagining of computational value. In the PoUW model, the focus isn't just on expanding the blockchain, but on endorsing and incentivizing truly productive computational endeavors. With this transition, node operators within the AIPG network will take on the role of hosting individual local LLMs and other local AI workloads. By doing so, AIPG not only democratizes access to these powerful AI tools but also actively offers rewards for hosting and running inference tasks on these models.

As the AIPG ecosystem evolves, our vision encompasses the potential to support a broader range of AI workloads beyond just LLMs and AI Art. For miners, this shift to PoUW might necessitate some adjustments to their existing setups, ensuring they're equipped to optimally host and run LLMs and other potential AI workloads. This alignment with PoUW is essential to ensure nodes can handle high PCie bandwidth AI tasks, reinforcing the network's growth, security, and overarching mission.

By intertwining the domains of blockchain and AI, AIPG endeavors to stimulate a more inclusive and expansive movement in AI and machine learning. We're not just nurturing a network; we're curating a community poised to drive the next wave of AI advancements.

Future Plans and Roadmap

The trajectory of AIPG is both a testament to our passion for AI and a roadmap that seeks to catalyze an AI renaissance.

Here's a glimpse of our envisioned milestones:

Establishment of the PoUW Model

The foundation of our roadmap revolves around the transition from PoW to PoUW, emphasizing local LLM hosting. This shift aims to bridge blockchain with tangible, real-world AI applications, rewarding node operators for hosting and inferencing on LLMs and other workloads.

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Validator Nodes Integration

With the integration of validator nodes, we seek to ensure the authenticity of LLM inference or Stable Diffusion image generation. These nodes, backed by a PoS mechanism requiring approximately 10,000 AIPG coins, will use consensus algorithms to validate and verify AI tasks, ensuring the integrity of the system and discouraging false reporting.

Broadening AI Workload Support

As AIPG matures, we anticipate diversifying beyond LLMs, allowing nodes to host and be rewarded for a broader spectrum of AI workloads. This expansion is a nod to our commitment to a dynamic and multifaceted AI ecosystem.

Engaging Collaborations

Building on our potential collaborations, we aim to foster relationships with open-source AI communities, research institutions, hardware providers, and AI-driven industries. These partnerships can enhance the AIPG network's capabilities, ensuring it remains at the forefront of AI and blockchain convergence.

Empowering the Community

Central to our vision is the democratization of AI. By facilitating access to LLMs and other AI tools, we aspire to empower individuals, researchers, and developers, making AI a universally accessible resource rather than a restricted commodity.

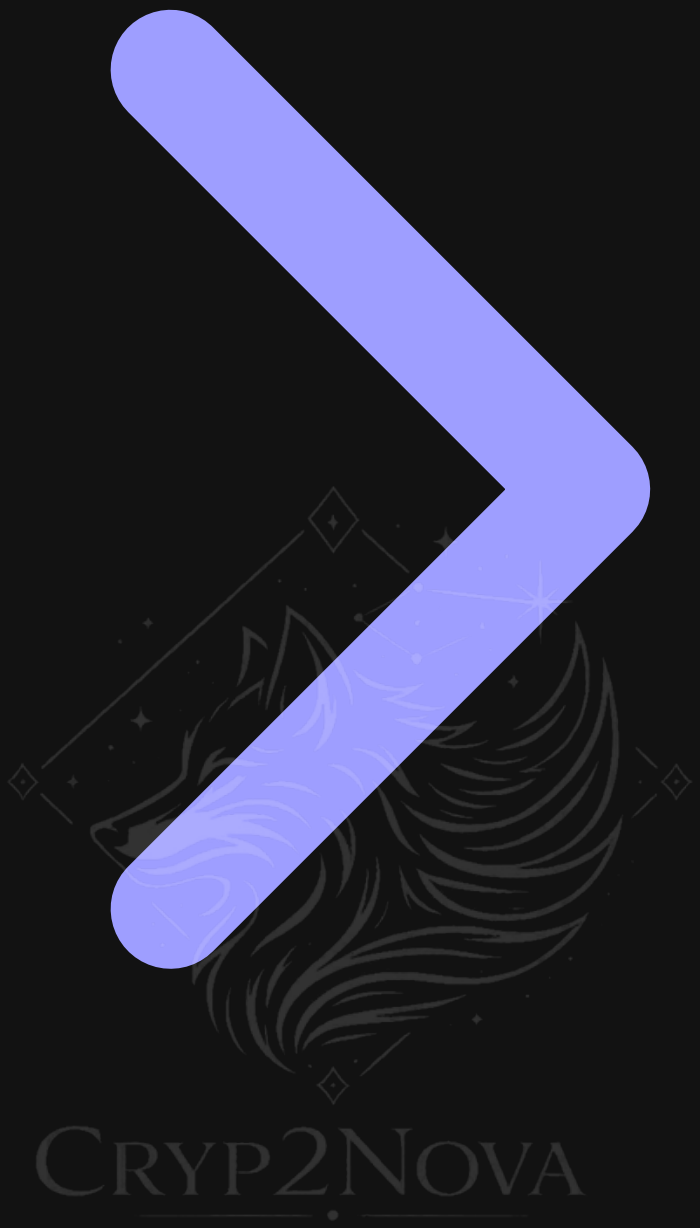
Nurturing Innovation

While our roadmap provides a structured path, we remain agile and receptive to novel AI advancements. AIPG is committed to integrating cutting-edge technologies, ensuring our community always has access to the best in AI.

Community Engagement

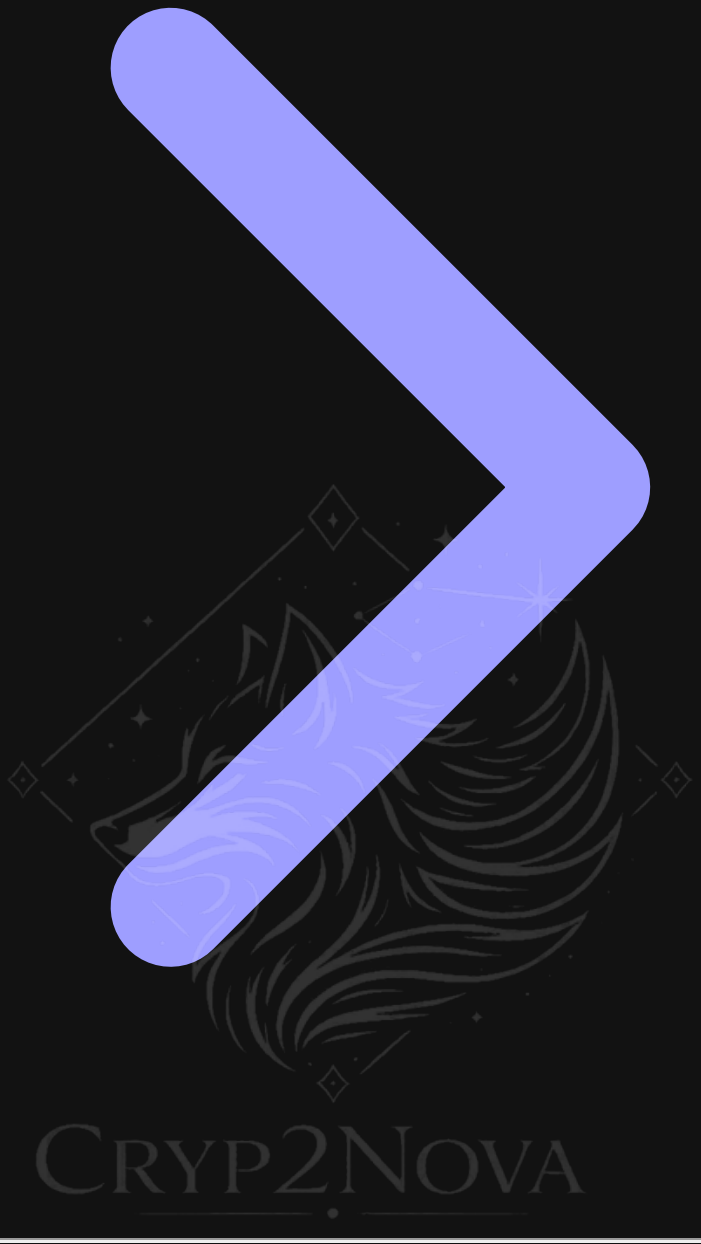
Recognizing that our strength lies in our community, we'll be hosting workshops, webinars, and forums, fostering a space for knowledge exchange, collaboration, and collective growth. AIPG's roadmap is more than a series of milestones. It's a call to action, an invitation to be part of a transformative journey in AI. As we chart this course, we invite every AI enthusiast, developer, and visionary to join us. Together, we will usher in an era where local AI flourishes, democratized and accessible to all.

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Token FactorySimple Text Worker

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