

Metabit: Multidimensional Intelligence Architecture

v2.0

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Abstract

Metabit is a blockchain platform based on the PoAS (Proof of Authority and Stake) hybrid consensus mechanism, allowing different nodes to play various roles in operating the network, validating transactions, packing and settling blocks, and providing storage and bandwidth. Building on this architecture, Metabit is transitioning to a multidimensional intelligence architecture based on AI in its v2.0 phase, connecting with the rapidly evolving AI ecosystem. This transformation provides high-performance infrastructure for large-scale commercial applications, revolutionizing the Web3 ecosystem. Additionally, Metabit is committed to providing a robust and secure network for enterprises operating in the Web3 space, leading its blockchain with over 10 million active users and 16 million valid addresses into the era of AI-driven multidimensional intelligence architecture.

1 Introduction

Metabit distinguishes itself from other blockchains through its unique PoAS consensus mechanism and leverages its innovative protocols and features to attract users and ecosystem partners. Metabit's unique technological innovations involve ZK Rollup and MLSD. ZK Rollup enables the Metabit network to transition from layer one to layer two. The Metabit Liquid Staking Derivatives Protocol (M-LSDP) is an innovative initiative by the Metabit team to enhance the Proof-of-Stake (PoS) mechanism at the protocol level within the Metabit ecosystem. This protocol aims to introduce a liquid staking derivatives (LSD) model within the Metabit ecosystem.

In the fiercely competitive market, Metabit needs to continue innovating and evolving to remain competitive and establish a significant presence in the rapidly growing layer-one blockchain industry. Consequently, Metabit proposes the introduction of AI across various layers as the next iteration direction for the public chain. Metabit's Multidimensional Intelligence Architecture encompasses the application of various AI technologies, integrating AI comprehensively at all levels to enhance network efficiency, security, and intelligence. By integrating AI across multiple dimensions, including the consensus layer, DePIN layer, DeAI layer, and DApp layer, Metabit aims to build an intelligent, efficient, secure, and decentralized blockchain platform. The multidimensional intelligence architecture not only emphasizes the use of different types of AI models but also incorporates AI technology into every core layer of the blockchain, driving Metabit to new heights of development. Particularly through multimodal models, it supports the processing and generation of various data forms, including text, images, videos, and voice, further enhancing the system's intelligence and

adaptability.

The consensus layer employs AI expert models for transaction validation and decision-making, ensuring network security and efficiency. The DePIN layer uses optimized algorithms to efficiently allocate computing power provided by users and the community, which is then used for training models in the DeAI layer. Community-provided data is used to train more accurate AI models, with communities that provide accurate and comprehensive data being rewarded, thus creating a positive feedback loop. The AI models trained by DeAI serve as the cornerstone of the Metabit ecosystem, widely applied across the DApp layer. Devices and data connected to the DApp layer further empower the DePIN and DeAI layers, serving as new sources of computing power and training data, achieving a continuous positive feedback loop.

2 Overview of the METABIT Chain

Metabit 2.0 chain framework adopts a five-layer architecture: DApp, DeAI, DePIN, PoAI consensus layer, and EVM.

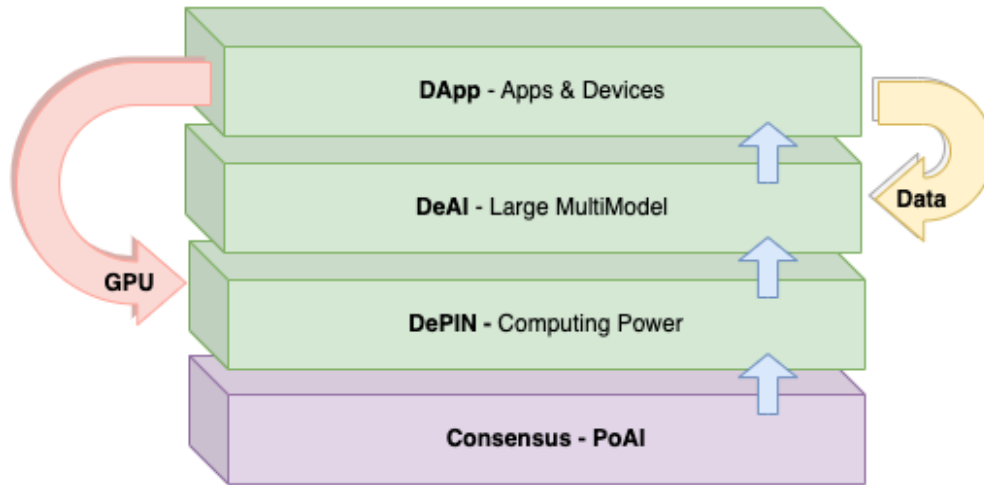


Fig. 1: Metabit Chain Layers

2.1 Virtual Machine Layer (EVM)

The virtual machine layer adopts the Ethereum Virtual Machine (EVM) to ensure seamless compatibility with the existing Ethereum ecosystem and support the efficient execution of smart contracts. EVM, as a stable and widely practiced technical foundation, provides reliable support for the implementation of the Multidimensional Intelligence Architecture, reducing development difficulty and improving development efficiency.

2.2 Consensus Layer

In the consensus layer, Metabit transitions from traditional Proof of Stake (PoS) and Proof of Authority (PoA) to the innovative Proof of AI (PoAI) mechanism. By introducing multiple AI expert models using the Mixture of Experts (MoE) architecture, PoAI significantly enhances the intelligence of transaction validation, DAO decision-making, security monitoring, and resource allocation. PoAI not only improves the efficiency and security of the consensus process but also substantially increases the network’s decentralization.

2.3 DePIN Layer

The DePIN layer achieves efficient utilization of GPU computing resources through a three-tier solution. First, it leverages idle GPU resources from ETH miners who have transitioned to PoS, Metabit’s purchase of idle GPUs, and community-shared GPU and edge computing power. Second, the proprietary DePIN algorithm, developed based on the NVIDIA CUDA Toolkit and TensorFlow, allocates token rewards according to the FLOPS stage and dynamically adjusts the computing power ratio for training investment advisor models. Finally, AI DApp computing power allocation will be based on real-time computing power quotations and FLOPS usage, using distributed task allocation algorithms to provide efficient computing resources for DApp developers. Node stacking is also a mechanism to incentivize users to share computing power.

2.4 DeAI Layer

The DeAI layer includes language models and investment advisor models, specifically designed for the Web3 environment. By integrating open-source models like LLaMA and Mistral, with data sourced from Web3 project websites, forums, and on-chain transaction information, the Multidimensional Intelligence Architecture supports language interaction and multimodal models capable of recognizing and generating text, images, videos, and audio. Trained on precise historical transaction data provided by project participants, it supports multi-agent interaction across language models and offers different levels of advisor models based on user stake levels. Additionally, a community labeling incentive mechanism allows users to participate in evaluating language model outputs and receive token rewards, continuously improving model quality.

2.5 DApp Layer

The development of the DApp layer will progress through phased approaches to gradually achieve comprehensive deployment of intelligent applications. In the initial phase, personal intelligent digital avatars will be realized, allowing users to delegate tasks to intelligent agents. The mid-term phase will create an interaction platform between humans and intelligent digital avatars, enhancing the human-machine interaction experience. The final phase aims to build a harmonious metaverse society where humans and AI coexist. Through these phased advancements, the DApp layer will encompass intelligent applications such as investment advisor apps, AI DAOs, and AI virtual agents, significantly enhancing user experience and platform value.

Through the Multidimensional Intelligence Architecture, Metabit will fully integrate AI technology at all levels, creating an intelligent, efficient, secure, and decentralized blockchain platform. This strategy not only enhances existing technical capabilities but also lays a solid foundation for future innovation and development.

3 Layer Overview

3.1 EVM

The Metabit chain network layer utilizes a decentralized network layer based on the libp2p protocol. This protocol provides fundamental peer-to-peer network elements such as peer discovery, connection management, and secure information transmission. The network relies on secure identity services to manage peer connections and handshakes, ensuring that only valid peers can join the network. It operates through a set of staking management contracts on the EVM and is supported by a set of incentivized validators running nodes. This approach allows participants to stake BMTC tokens on EVM smart contracts to participate in validation, earning staking rewards by validating state transitions on the Metabit network. The fast finality layer periodically consolidates state through checkpoints, enhancing state security. The EVM-compatible chain features high throughput and fast block times, optimizing scalability across a wide range of decentralization. It ensures secure final state submission, maintaining a high degree of decentralization through a large validator set.

The native token of the Metabit Chain is the BMTC token (BMTC), similar to ETH in Ethereum. It is commonly referred to as the gas token. This token functions similarly to ETH on the current Ethereum chain, with transaction fees deducted from the sender's account in the form of native tokens.

3.2 Consensus Layer: From Metabit PoAS to PoAI

In version 1.0, Metabit implemented MPoAS, a hybrid consensus mechanism known as Proof of Authority and Stake (PoAS), combining Proof of Stake (PoS) and Proof of Authority (PoA). It offered advantages in reducing block time and costs but sacrificed network security and decentralization. The PoA algorithm simplified the validation process, reduced the power required for network operation, while the PoS mechanism allowed users to participate in network security through staking, promoting decentralization. PoA ensured continuous connection between nodes without requiring specific hardware, and validators could maintain network operations without solving puzzles, accelerating transaction validation. Block creation was predictable, and the transaction rate was higher than PoS.

MetaBFT is the powerful consensus mechanism adopted by the Metabit network, comprising a consensus engine and consensus protocol. MetaBFT uses the IBFT consensus engine and PoS architecture to seal blocks, provide network functions, and manage the network. Core smart contracts work with the consensus engine to define all PoS rules for the network. The MetaBFT consensus engine is based on the IBFT 2.0 protocol, responsible for sealing blocks and ensuring network integrity in the presence of malicious nodes. IBFT allows for f faulty nodes in a network of $3f + 1$, as long as two-thirds of the nodes are honest. Each MetaBFT node maintains a local copy of the blockchain, with block height defined as the number of parent links between it and the genesis block.

The MetaBFT consensus protocol is implemented through a set of core smart contracts, enabling staking functions, defining validator incentives, and managing the validator set. $MPoAS = PoA + PoS$, where PoA stands for Proof of Authority and PoS stands for Proof of Stake.

To better adapt to future demands and challenges, Metabit has chosen to evolve from the hybrid PoAS

(PoS + PoA) consensus mechanism to the Proof of AI (PoAI) mechanism. PoAI combines the advantages of artificial intelligence, enhancing network security, efficiency, and decentralization through intelligent decision-making and validation mechanisms.

3.2.1 Innovation in PoAI Mechanism

Metabit transitions from the hybrid consensus mechanism to the innovative Proof of AI (PoAI) mechanism. PoAI leverages the Mixture of Experts (MoE) architecture based on the generative pre-trained transformer, introducing multiple AI expert models to enhance the intelligence of transaction validation, DAO decision-making, security monitoring, and resource allocation.

3.2.2 MoE Architecture

The core concept of the MoE architecture is to use multiple independently trained expert models, each excelling in specific tasks or subsets of input data. A router model determines which expert handles specific inputs, ensuring efficient and precise decision-making. The advantages of this architecture include efficiency, flexibility, and scalability. By using sparse activation, it only calls upon specific expert models when needed, reducing computational costs.

3.2.3 Roles of the Four AI Expert Models

In transaction validation, the PoAI mechanism monitors and validates network transactions, identifying and filtering malicious transactions and attacks. Multiple expert models focus on different types of transactions and network behaviors, with the router selecting the optimal expert for validation. In DAO decision-making, PoAI analyzes community proposals, provides decision support, and conducts voting. Different expert models handle various types of proposals and community feedback, ensuring comprehensive and accurate decisions.

The security monitoring model is responsible for real-time detection and prevention of network attacks, monitoring node behavior to ensure network security. Multiple expert models monitor different types of security threats, with the router selecting the best expert for prevention and response. The resource allocation model optimizes network resource distribution, ensuring efficient operation. Different expert models handle various resource demands and network states, with the router selecting the best expert for resource allocation.

3.2.4 Steps and Processes

In model selection and training, appropriate deep learning models are chosen based on network needs and goals. A large volume of transaction data, community proposals, security threats, and resource allocation records are collected and annotated for training. The router model is designed and implemented to ensure it accurately selects the best expert model.

During testing and optimization, large-scale simulations verify model performance and stability. Optimized models are deployed to the blockchain network, with ongoing monitoring and necessary adjustments. A real-time feedback and update mechanism is established to monitor model performance and network status, quickly identifying and resolving issues. Based on network demands and performance feedback, expert models and the router model are regularly updated and optimized.

Through these innovations and improvements, Metabit’s consensus layer will achieve higher efficiency, security, and decentralization, providing a solid foundation for the entire ecosystem.

3.3 DePIN Layer: Driving Distributed AI Computing Power

The DePIN layer achieves efficient utilization of GPU computing resources through a three-tier solution, promoting the proliferation of AI training and intelligent applications. By integrating existing idle resources, project acquisitions, and community contributions, the DePIN layer optimizes resource allocation while ensuring system scalability and sustainability.

3.3.1 Computing Power Sources

To meet the growing demands for AI training and intelligent applications, sufficient computing resources must be ensured. Multiple channels are utilized to obtain computing power, maximizing the use of existing resources while ensuring network stability and efficiency. Firstly, idle GPU resources from ETH miners transitioning to PoS are leveraged, providing miners with new revenue streams and deploying these high-performance computing resources for AI training. Secondly, Metabit purchases and deploys a large number of idle GPUs to ensure basic computing power supply, enhancing the network’s computing resource pool and guaranteeing stable operation under various loads. Lastly, community members can share personal GPUs and edge computing power in exchange for token rewards, fostering active community participation and collective development. Detailed participation steps and incentive mechanisms ensure widespread involvement, including how to connect GPU computing power to the Metabit network, necessary software and hardware configurations, etc.

3.3.2 Proprietary DePIN Algorithm

The proprietary DePIN algorithm, developed based on the NVIDIA CUDA Toolkit and TensorFlow, features efficient computing power scheduling, dynamic load balancing, and real-time performance monitoring, ensuring efficient use of computing power. Advanced encryption and privacy protection measures ensure the security of data and computing processes. By scheduling computing power and balancing loads, it dynamically adjusts computing resources based on real-time performance monitoring, ensuring efficient utilization. Additionally, token rewards are allocated based on FLOPS stages, dynamically adjusting the computing power ratio for training investment advisor models, ensuring efficient resource use and fair distribution. Detailed participation steps and token reward plans ensure active participation from miners and community members.

3.3.3 Computing Power Allocation

In terms of computing power allocation, the DePIN layer employs a distributed task allocation algorithm, ensuring efficient use of computing power based on real-time computing power quotations and FLOPS usage. A computing power market is introduced, allowing DApp developers and computing power providers to freely trade computing resources, ensuring market transparency and fairness. A transparent computing power market is built, with smart contracts automatically executing transactions and computing power allocations, reducing human intervention and enhancing efficiency and security.

Through these measures, Metabit’s DePIN layer will achieve efficient, secure utilization of distributed AI computing resources, providing robust support for model training in the DeAI layer. Additionally, the DePIN layer’s design will promote active community participation and collective development, building a more prosperous and sustainable blockchain ecosystem.

3.3.4 User and Community Incentive Mechanisms

To encourage users and the community to share computing power with Metabit’s DePIN layer, a series of reward mechanisms have been designed. Community members can share personal GPUs and edge computing power in exchange for Metabit’s tokens (BMTC). Rewards are calculated based on the FLOPS stage of contributed computing power, ensuring each contributor receives fair compensation based on their contribution.

To incentivize further community participation in computing power sharing, Metabit has established additional reward mechanisms for long-term contributors and high-performance nodes. Long-term contributors and providers of high-performance computing power will receive priority and additional token rewards, encouraging sustained contributions and high-quality computing power provision.

These reward mechanisms not only enhance community participation but also optimize computing resource allocation and utilization, ensuring the DePIN layer has sufficient computing power to support AI training and intelligent application proliferation. Through these incentive measures, Metabit’s DePIN layer achieves efficient, secure utilization of distributed AI computing resources, providing robust foundational support for the entire ecosystem.

3.4 DeAI Layer: Intelligent Model Training and Application

The DeAI layer is the core component of Metabit’s Multidimensional Intelligence Architecture, leveraging the efficient computing resources provided by the DePIN layer to focus on training and optimizing AI models. These models include but are not limited to language models and investment advisor models, covering a wide range of intelligent applications.

3.4.1 Data Sources

The DeAI layer’s data sources are extensive and diverse, ensuring a variety of training data to enhance model accuracy. Primary data sources include on-chain transaction data, exchange data, other media data, and community-provided data. On-chain transaction data is obtained from the blockchain network, offering direct insights into market behavior. Exchange data from major cryptocurrency exchanges helps the models understand market dynamics and price fluctuations better. Other media data includes news, social media, forums, and more, providing supplementary information on market sentiment and trends. Community members can also submit data for model training, ensuring data diversity and coverage.

3.4.2 Community Incentive Mechanism

To ensure the completeness and quality of data sources, the DeAI layer incorporates a community incentive mechanism. Community-submitted data undergoes screening and validation, with data sources resulting in more effective model training being rewarded with tokens. Community members’ data sets are subject to

community voting to determine their suitability for training, ensuring data quality and relevance. Communities providing more accurate and comprehensive data receive Metabit tokens (BMTC) as rewards, with greater data completeness and accuracy yielding higher rewards. This incentive mechanism forms a positive feedback loop, motivating community members to continuously supply high-quality data, further enhancing model training effectiveness.

3.4.3 Intelligent Models

AI models trained by the DeAI layer include but are not limited to language models and investment advisor models. Language models integrate open-source models like LLaMA and Mistral, combined with data from Web3 project websites, forums, and other sources, offering efficient language understanding and generation capabilities. Investment advisor models, based on transaction data and market analysis, provide investment advice and market forecasts to help users make more informed decisions. Additionally, these models support multimodal interaction, capable of recognizing and generating text, images, videos, and audio. The DeAI layer also supports cross-language model interactions, enhancing model collaboration and overall performance.

To cater to different users, the DeAI layer introduces a tiered model mechanism. Users with higher stakes have access to more comprehensive and efficient advisor models, while ordinary stake users can use basic models, enjoying fundamental AI services.

3.4.4 Multimodal Models

The DeAI layer’s multimodal models extend beyond language processing to include various data forms such as images, videos, and audio. These models interact and transform across different modalities, offering richer and more diverse intelligent services. For instance, advisor models can communicate through language, recognize market trends through images, analyze market dynamics through videos, and provide real-time advice through voice interactions. The introduction of multimodal models significantly expands the application scope and flexibility of the models, providing users with more comprehensive and intelligent service experiences.

3.4.5 Community Labeling Incentives

To further enhance model quality, the DeAI layer also implements a community labeling incentive mechanism. During specific activities, community members can participate in evaluating and labeling language model outputs, improving model quality and earning token rewards.

Through these measures, the DeAI layer not only ensures efficient and accurate model training but also forms a self-reinforcing and self-optimizing intelligent ecosystem through incentives and community participation. The AI models trained will serve as the foundation of the Metabit ecosystem, widely applied in the DApp layer to provide smarter services. Devices and data integrated into the DApp layer further empower the DePIN and DeAI layers, serving as new sources of computing power and training data, achieving continuous positive feedback loops. In this way, the various layers of the Metabit ecosystem work closely together to form a self-reinforcing and self-optimizing intelligent blockchain ecosystem.

3.5 DApp Layer: The Key to Intelligent Applications and Ecosystem

The DApp layer is the front-end display and user interaction part of the Metabit ecosystem, carrying various intelligent applications, including investment advisor applications, AI DAOs (decentralized autonomous organizations), and AI virtual agents. This layer not only provides intelligent services to users but also plays a crucial role in the entire ecosystem. The intelligent applications in the DApp layer rely on high-efficiency AI models trained by the DeAI layer, offering users a range of intelligent services. The investment advisor application provides accurate investment advice and market forecasts by comprehensively analyzing on-chain transaction data, exchange data, other media data, and data provided by the community. AI DAOs use smart contracts and AI decision-making models to enhance the efficiency and transparency of decentralized governance. AI virtual agents use multi-modal interaction technology to offer personalized intelligent assistant services, including voice assistants, image recognition, and text generation.

3.5.1 Device and Data Interoperability

Devices and data accessed by the DApp layer not only provide services to users but also feedback to the DePIN and DeAI layers, forming a positive loop of data and computing power. Specifically, the device and data interoperability mechanisms of the DApp layer include:

- **Device Access:** Users may connect various devices, including personal computers, smartphones, and IoT devices, when using DApp applications. These devices can provide a large amount of computing resources and data sources. For example, users' smartphones and personal computers can contribute computing power to the DePIN layer's resource pool. This device access mechanism not only increases available computing power but also enhances the computing capacity and efficiency of the entire ecosystem.
- **Data Feedback:** In providing intelligent services, the DApp layer generates a large amount of user interaction data, usage data, and behavior data. This data can be fed back to the DeAI layer as an important source of training data for AI models. For example, user behavior data generated by the investment advisor application can help optimize investment decision models, and interaction data from AI virtual agents can improve the accuracy of natural language processing models. This data feedback mechanism allows the DeAI layer to continuously obtain the latest and most comprehensive data, improving the training effect and application level of AI models.
- **Computing Power Contribution:** Devices connected to the DApp layer can contribute computing power to distributed computing tasks of the DePIN layer. While using DApp applications, the idle computing power of users' devices can be added to the DePIN layer's resource pool for AI model training and optimization. This computing power contribution mechanism not only improves the utilization rate of computing resources but also provides users with a way to earn token rewards, encouraging more users to participate in the ecosystem.

3.5.2 Positive Loop

Through device access, data feedback, and computing power contribution, the DApp layer, DePIN layer, and DeAI layer form a closely interconnected mechanism. This positive loop mechanism ensures resource sharing and coordinated optimization among the layers, enhancing the efficiency and intelligence level of the entire ecosystem.

3.5.3 Future Development Stages

The development roadmap of the DApp layer can be divided into the following stages:

- **Cambrian Stage (2024-2025):** The focus is on developing basic intelligent applications, enabling every user to delegate part of their work to their intelligent digital avatars. This includes investment advisor applications and basic AI virtual assistants. Just as trilobites first sensed light 540 million years ago, triggering the Cambrian explosion with a rapid increase in biodiversity, in this stage, DApps will use the data collection capabilities of user devices to lay the foundation for intelligent applications.
- **Triassic Stage (2025-2027):** This stage will build an interaction platform between humans and intelligent digital avatars, enhancing the interactivity and intelligence of intelligent applications. More advanced functions, such as real-time market analysis and personalized financial planning, will be introduced. From vision to understanding, in the Triassic stage, smart devices and DApps will evolve from simple data collection to complex data processing and understanding. Users' devices will not only collect data but also perform initial analysis and processing, similar to the evolution of the nervous system in the Triassic period. The perception capabilities of smart devices will be greatly enhanced, making DApp services more intelligent and personalized.
- **Neogene Stage (2027-2030):** The final stage aims to build a harmonious metaverse society where humans and AI coexist, with intelligent applications fully integrated into users' daily lives and work, providing comprehensive intelligent services and support. From understanding to action, in the Neogene stage, smart devices and DApps will not only understand data but also make intelligent decisions and actions. Just as the spatial intelligence of organisms developed in the Neogene period, DApps will achieve intelligent decision-making and automated operations through multi-modal data from user devices. DApp services will become more intelligent and personalized, significantly enhancing the user experience.

Through these stages, the DApp layer will continuously evolve and improve, becoming an indispensable part of the Metabit ecosystem. The intelligent applications and device interoperability mechanisms of the DApp layer not only enhance the user experience but also promote the continuous optimization and intelligent development of the entire ecosystem.

4 Chain Technical Logic Architecture

4.1 Logical Architecture Components

- **libp2p:** Metabit provides a network layer designed specifically for peer-to-peer network architecture for the Supernet.
- **Bridge:** The built-in bridge mechanism enabled by BFT allows information to be passed between the Superkernel and another "Proof of Stake" blockchain without mapping.
- **Memory Pool:** Enables multiple validators to aggregate their signatures to create a single aggregate signature representing all validators in the pool.
- **Consensus:** MetaBFT is the consensus mechanism of Metabit Supernet, consisting of the IBFT 2.0 consensus engine and consensus protocols (including bridging, staking, and other utilities).

- **Blockchain:** IBFT coordinates all operations within the system, manages state transitions, and is responsible for state changes when new blocks are added to the chain.
- **Runtime (EVM):** Uses EVM as the runtime environment for executing smart contracts.
- **TxPool:** Represents the transaction pool and is closely connected with other modules in the system.
- **JSON-RPC:** Facilitates interaction between dApp developers and the blockchain, allowing developers to send JSON-RPC requests to Supernet nodes and receive responses.
- **gRPC:** Crucial for operator interaction, it allows node operators to interact easily with clients and provides a seamless user experience.

4.2 Native Token of Metabit

The native token of Metabit Chain is the BMTC token, similar to ETH in Ethereum. It is commonly referred to as a gas token. This token functions in the same way as ETH currently operates on the Ethereum chain. The native token is used as a fee when sending transactions on the Metabit Chain. This mechanism prevents spam on the Metabit Chain, incentivizes block producers to maintain the chain's operation, and deters malicious behavior.

When sending transactions, the sender defines the GasLimit and GasPrice and publishes them on the Metabit Chain. Each producer can define the minimum gas price they are willing to accept using the `gas-price` option when starting their Metabit Chain node. If the gas price defined by the user is equal to or greater than the gas price defined by the producer, the producer will accept the transaction and include it in the next available block. This allows each producer to set their own minimum gas price requirements. The transaction fee is deducted from the sender's account in the form of native tokens. The following formula is used to calculate the transaction fee:

$$Tx.Fee = Tx.GasUsed * Tx.GasPrice \quad (1)$$

A portion of the transaction fees from all transactions within a block will be transferred to the producer's account via a Binance transfer. Since having more stakes increases the probability of becoming a producer, validators with higher stakes can accordingly receive more rewards in the form of transaction fees.

4.3 Metabit Chain TPS

Metabit Chain supports 30,000 TPS

4.4 Chain Node Architecture

For the Metabit node system, the design adopts a dual-layer implementation, namely the POA layer and the POS layer.

- **Implementation of Proof of Authority (PoA):** Metabit full nodes support the Proof of Authority (PoA) consensus algorithm in their protocol, which can be used as an alternative to the Proof of Work or Proof of Stake algorithms. The PoA blockchain grants the authority to create new blocks to a set of nodes on the network, instead of obtaining the right to create new blocks through a target formula with

integer or UTXO inputs. If the integrity of the nodes with this authority is maintained, using PoA can more easily protect smaller blockchains, which are usually private, but not necessarily so. So, what attacks are small PoW and PoS blockchains vulnerable to? Small PoW blockchains are susceptible to attacks that rent large amounts of computational power to try and overwhelm the network. Small PoS blockchains often have a relatively small number of tokens, making them vulnerable to attacks where a bad actor accumulates more than 50% of the tokens without raising suspicion. There are two additional advantages to using the PoA algorithm: a. Since the identity of the block creator can be identified, they can be held accountable. b. Since blocks are published at stable time intervals, the network's predictability is higher. In other words, they follow a strict "target interval."

- **Implementation of Proof-of-Stake (PoS):** The Proof-of-Stake Verifier layer in our architecture is responsible for checkpointing blocks to the main chain. This functionality is achieved by modifying the signature scheme and various data structures on the Metabit consensus engine's foundation and periodically publishing the Merkle tree root to the root chain. The verifier layer periodically publishes snapshots called checkpoints, which verify all blocks since the last checkpoint, create a Merkle tree of block hashes, and publish the Merkle root hash to the Metabit mainnet. The verifier layer includes: 1 Forensic verification 2 Validation of blocks on the Metabit network's main chain 3 Validator and reward management 4 Ensuring synchronization with the Ethereum main chain 5 Decentralized bridge.

4.5 Metabit Chain Node Tokens

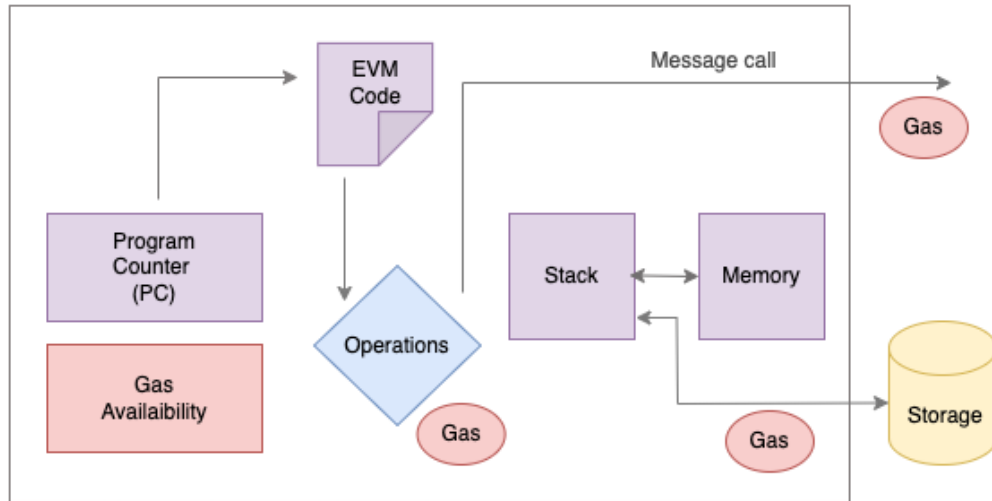


Fig. 2: BMTc

For the Metabit network, any participant can become a Metabit Light Node validator by running a full node to earn rewards and collect transaction fees. To ensure good participation by validators, they lock a portion

of their BMTC tokens as stakes in the ecosystem. Validators in the Metabit network are selected through regular on-chain auction procedures.

- **Stake:** To join the validator set, you must stake your BMTC tokens.
- **Unstake:** Unstaking allows validators to exit the active validator pool. To ensure good participation, validators' stakes are locked for 80 checkpoints.
- **Restake:** Validators can add more BMTC tokens to their stakes to earn more rewards and maintain their status among validators.

4.6 Chain Node Architecture:

Delegators: Staking can be expensive, raising the entry barrier and favoring the rich. Everyone should participate in network security and earn reward tokens. The only other option is to join a staking pool similar to a mining pool, and validators must be trustworthy. We believe adhering to the protocol is the best choice for new delegators because capital and rewards are public and protected by in-protocol mechanisms.

Delegators can participate in validation without running a full node. However, they can strengthen the network and earn rewards by collaborating with validators and paying a small commission to their chosen validator (which varies depending on the validator).

5 Metabit Chain Maintenance

5.1 Chain Deployment

Metabit Chain provides a "one-click" deployment through deployment scripts, offering a hassle-free setup for blockchain networks and allowing developers to seamlessly establish subchains. Metabit supports cloud deployment options, enabling developers and enterprises to easily and securely deploy subchains to the cloud. Through cloud deployment, users can leverage the scalability and flexibility of cloud infrastructure without the complexity of managing their own infrastructure. Metabit Chain supports deployment to various cloud platforms, allowing users to choose the cloud platform that best fits their needs and preferences. The Metabit Chain cloud deployment option also includes features and functionalities such as auto-scaling, load balancing, and disaster recovery, helping ensure network stability, security, and availability. These features are especially important for enterprise-level deployments that require high reliability and performance.

5.2 Node Monitor

Metabit Chain offers a tool, Meta-jaguar, designed for monitoring and alerting validators running on the Matic Network. It provides a standalone Grafana dashboard for better monitoring of validator and server health. It integrates with Telegram and Sendgrid to provide updates via notifications or email. It uses InfluxDb and Prometheus to store metrics and Grafana to display them. The tool's alerting section uses a modular approach, allowing users to decide which metrics should trigger alerts. Users can modify all notifications according to their preferences. By default, a basic level of notifications is enabled for inexperienced users, which can be modified by editing the configuration file.

6 Metabit Tokenomics

As previously mentioned, the token distribution of Metabit is categorized into different segments. The seed round allocates 20,000,000 tokens, the institutional round allocates 70,000,000 tokens, the IDO allocates 10,000,000 tokens, the foundation allocates 120,000,000 tokens, the team allocates 100,000,000 tokens, and the ecosystem allocates 680,000,000 tokens. These allocations represent the distribution of tokens among different stakeholders and purposes within the Metabit ecosystem.

- **Seed Round:** 20,000,000 tokens are allocated, accounting for 2% of the total token supply. Tokens have a 10% cliff period and a 6-month vesting period. Tokens will be issued quarterly over 28 months.
- **Institutional Round:** 70,000,000 tokens are allocated, accounting for 7% of the total token supply. Tokens have a 10% cliff period and a 3-month vesting period. Tokens will be issued quarterly over 24 months.
- **IDO (Initial DEX Offering):** 10,000,000 tokens are allocated, accounting for 1% of the total token supply. Tokens have no cliff period and are released at 16.6% monthly over 6 months.
- **Foundation:** 120,000,000 tokens are allocated, accounting for 12% of the total token supply. Tokens have no cliff period and a 12-month vesting period. Tokens will be issued quarterly over 34 months.
- **Team:** 100,000,000 tokens are allocated, accounting for 10% of the total token supply. Tokens have no cliff period and a 12-month vesting period. Tokens will be issued quarterly over 34 months.
- **Ecosystem:** 680,000,000 tokens are allocated, accounting for 68% of the total token supply. Tokens will be strategically issued according to market demand, with no specific cliff or vesting period.

6.1 Node Mining Model

Metabit employs an innovative consensus mechanism known as MPOAS (Multiparty On-chain Agreement System). In this consensus model, each node in the network assumes a specific role, contributing to the overall operation and security of the blockchain. In the Metabit network, validators play a critical role. Validators are responsible for verifying and confirming transactions, maintaining the integrity of the blockchain, and participating in the consensus process. They propose and confirm new blocks, ensuring network accuracy and security. Delegators, on the other hand, are participants who delegate their stakes to validators. Delegators contribute their BMTC tokens to trusted validators and earn rewards based on validator performance. Delegators can participate in the network consensus process without technical expertise or running their own nodes. By delegating their stakes, they contribute to network security and decentralization while earning proportional rewards. Validators and delegators form an integral part of the Metabit ecosystem, ensuring smooth blockchain operation and security while providing token holders with opportunities to actively participate and earn rewards for their contributions.

- Total Number of Nodes: 50,000
- Node Acquisition Method: Purchase on the official website - Institutional pre-booking whitelist
- Node Stake: Node owners need a minimum stake of 1,000 BMTC, falling below this stake triggers the slashing system.

- Release Rules: Initially 42.5 million BMTC tokens per year, halving every four years.
- Node Revenue Sources:
 - 100% personal staking annual interest rate and 10% direct referral mining reward.
 - Staking commission 0-5%.
 - 50% gas reward based on node staking weight and ecosystem rewards.

6.2 Light Node Mining Economic Model

- Validators: Light node holders.
- Delegators: Users who inject BMTC into light nodes.
- Invitation Code: Establishes mining reward relationships between the inviter and the invitee.
- Consensus: MPOASâMetabit Proof of Authorized Staking.
- Mining Volume: 340 million.
- Issuance Model: Halved every four years based on the remaining total volume, e.g., 42.5 million released in the first year, 170 million released after four years.
- Staking Rules: The minimum staking unit for light node holders is 100 BMTC, the maximum staking unit is determined by the capacity of the super node.
- Unstaking Responsibility: Delegators can unstake their principal at any time, which will be returned after 21 days, with interest stopping on the unstaking day. Validators can unstake their principal at any time, but if the personal unstake amount falls below 100 BMTC, it will trigger the penalty system.
- Invitation Mechanism and Interest Rewards: Node invitation rewards are a two-level relationship; the inviter receives 10% of the mining reward from direct invitees. Mining rewards are distributed linearly, with 1% released daily, completed in 100 days.
- Validator Reward Categories: Validators can enjoy personal staking rewards, referral mining rewards, gas fee rewards, node commission rewards, management fee return rewards, and ecosystem rewards.
- Penalty System: Validators with personal stakes below 100 BMTC will trigger the penalty system. During the penalty period, validators do not receive any invitation and staking rewards, nor can they withdraw their principal. Validators receiving more than three penalty triggers will be removed from all invitation relationships and validator status, with the light node managed by the Metabit management team.

6.3 Invitation Relationships and Identity Confirmation

When an invitee/regular user enters the node staking interface, a window will pop up prompting the user to choose their identity. Users can choose to continue staking BMTC or upgrade to a validator.

- Choose to Continue Staking: The invitee becomes a lifelong delegator for the light node.

- Choose to Upgrade to Validator: The inviter receives 10
- Successful Validator Invitation: The referral relationship remains unchanged, and the inviter receives 10

Referral Example (Assuming completion of 1 year): Validator A sets the commission fee to 5% of the mining reward. Assuming the current gas fee reward for A is 25 BMTC, with a management fee rebate of 50 BMTC after calculations from the entire network (BCDE), they have all staked 1,000 BMTC.

6.4 Current Staking Status

Currently, the Metabit community has reached a significant milestone, with 160,000 active wallet addresses. As part of its development strategy, Metabit aims to further expand the community, targeting a member count of between 200,000 to 300,000. This expansion plan is expected to activate approximately 300,000 active wallet addresses. The increasing number of active wallet addresses signifies higher engagement and interaction within the Metabit ecosystem, demonstrating the community’s enthusiasm and support for the platform.

7 Metabit Business Ecosystem

Metabit will focus on ecosystem development in the following eight areas:

7.1 DeAI Multimodal Model and DApp Application Loop

The multimodal models in the DeAI layer have extensive application potential and commercial prospects. Firstly, language models and advisory models can provide precise market forecasts and investment advice for the financial industry, helping users make more informed decisions. By offering efficient AI services, the DeAI layer can attract more users and enterprises, increasing the platform’s user base and market share. Secondly, AI models supporting multimodal interactions can be applied in various intelligent services, such as intelligent customer service, content generation, and data analysis, enhancing operational efficiency for businesses, reducing labor costs, and increasing profitability.

To achieve commercialization, Metabit can take the following measures. Firstly, establish a subscription model for AI services, providing tiered services for different users. High-stake users can enjoy advanced AI models and customized services, while ordinary stake users can use basic models and standard services. This subscription model can provide a stable revenue source for the platform. Secondly, collaborate with enterprises and research institutions to offer customized AI model development and technical support to meet the needs of various industries. Through partnerships, Metabit can expand its business scope and enhance its market influence. Lastly, promote the application of multimodal models across various industries, showcasing their practical effects and commercial value. Through case studies and market promotion, attract more enterprises and users to understand and utilize Metabit’s AI services, further expanding market share and brand awareness.

The trained AI models will serve as the cornerstone of the Metabit ecosystem, widely applied in the DApp layer to provide more intelligent services to users. Devices and data connected to the DApp layer further

empower the DePIN layer and the DeAI layer, becoming new sources of computational power and training data, achieving a continuous positive feedback loop. In this way, the Metabit ecosystem tightly integrates its layers, forming a self-reinforcing, self-optimizing intelligent blockchain ecosystem, providing strong support for commercial and industrial innovation.

7.2 DePIN Computation Incentive Mechanism

The DePIN layer, through its innovative computation incentive mechanism, drives the widespread application of AI model training and intelligent applications, demonstrating significant potential for commercial and industrial innovation. This mechanism not only optimizes resource allocation but also ensures the system's scalability and sustainable development.

In terms of commercial and industrial innovation, Metabit can enhance its commercial value through various initiatives. Firstly, construct a transparent computational market, allowing DApp developers and computation providers to freely trade computational resources. Through smart contracts, transactions and resource allocations are automatically executed, reducing human intervention and increasing efficiency and security. Secondly, establish a computational leasing platform where users and enterprises can rent computational resources on demand for AI training, data analysis, and other high-computation tasks. This model can lower operational costs for businesses and improve resource utilization. Thirdly, collaborate with enterprises and research institutions to offer customized computational solutions to meet the diverse AI application needs of various fields. Through alliances and resource sharing, promote the common development of the AI industry. Additionally, design flexible token reward plans to incentivize more users and enterprises to contribute computational power. Long-term contributors and nodes providing high-performance computation will receive priority and additional token rewards, encouraging continuous contributions and the provision of high-quality computational power. Lastly, adopt a computational crowdfunding model where users can participate in projects by contributing computational power, sharing profits, and quickly gathering large amounts of computational resources, increasing community engagement and cohesion.

Through these innovative business models and measures, Metabit not only enhances the utilization of computational resources but also provides diverse services and solutions for users and enterprises, promoting the sustainable development of the entire ecosystem. This mechanism optimizes and efficiently utilizes computational resources, ensuring the DePIN layer consistently has sufficient computational power to support AI training and the widespread application of intelligent applications, thereby driving commercial and industrial innovation. Through these incentive measures, Metabit's DePIN layer achieves efficient and secure distributed AI computational resource utilization, providing a solid foundation for the entire ecosystem and forming a self-reinforcing, self-optimizing intelligent blockchain ecosystem.

7.3 Wallet Identity Recognition

Metabit Wallet Identity is a revolutionary solution designed to enhance the security and privacy of digital asset management. In today's digital economy, the widespread use of cryptocurrencies and digital assets brings new challenges in protecting personal assets and maintaining user privacy. Metabit Wallet Identity uses advanced technologies such as decentralized identity verification, encryption, and user-centric control to provide users with a secure and trusted identity framework. By emphasizing security, privacy, and user authorization, Metabit Wallet Identity provides individuals with a comprehensive solution to securely manage

their digital assets while protecting personal privacy.

7.4 Metabit Decentralized Exchange

Metabit Decentralized Exchange offers extensive trading features and innovative solutions. As a next-generation cryptocurrency trading platform, Metabit aims to provide users with a secure, efficient, and autonomous trading environment. Whether you are a beginner or an experienced trader, Metabit offers comprehensive features, supporting multiple mainstream cryptocurrency trading pairs on a single platform, allowing users to engage in diversified trading and meet all their trading needs in the cryptocurrency market.

7.5 DeFi and Financial Derivatives

a. Metabit DeFi: Metabit is committed to establishing a robust and inclusive DeFi ecosystem, providing decentralized financial solutions to users. Through blockchain technology and smart contracts, it aims to eliminate intermediaries, improve financial accessibility, and promote transparent and secure transactions. The Metabit DeFi platform offers a range of decentralized services, including decentralized exchanges, liquidity pools, and asset collateralization. In the future, Metabit will also introduce lending and community governance tokens, enabling users to fully control their assets and participate in various financial activities.

b. Financial Derivatives: Committed to driving innovation, Metabit recognizes the potential of financial derivatives in enhancing risk management and providing investment opportunities in the DeFi field. Metabit is dedicated to developing and introducing various financial derivatives, enabling users to hedge risks, speculate on asset prices, and adopt leveraged investment strategies. These derivatives include options, futures, swaps, and other derivatives designed to meet the evolving needs of users.

7.6 Metabit Stablecoin

Metabit's token, M-USD, is a stablecoin designed to provide stability and security in the volatile cryptocurrency market. Built on a robust blockchain infrastructure, Metabit aims to address the challenges of price volatility and lack of stability, which often hinder the widespread adoption of cryptocurrencies. By leveraging advanced algorithms and decentralized governance models, Metabit's stablecoin offers a reliable and efficient medium of exchange, fostering trust and confidence among users, providing ample liquidity in the virtual currency market, and promoting financial inclusion in the digital economy.

7.7 MetaDAO and Foundation

MetaDAO is a decentralized autonomous organization (DAO) that governs the Metabit ecosystem using MDAO governance tokens.

a. MetaDAO: MetaDAO represents a shift in decision-making and governance models. It enables token holders and community members to actively participate in shaping the platform's direction and future. Through a decentralized governance model, stakeholders can propose key decisions and vote on platform upgrades, project financing, and ecosystem enhancements. MetaDAO ensures fairness and inclusivity in the decision-making process, giving all community members a voice and fostering a vibrant and engaging ecosystem.

b. Metabit Foundation: The Metabit Foundation is the driving force behind platform development and ecosystem growth. As a non-profit organization, it is dedicated to supporting research, education, and community activities. The foundation’s main focus is to promote innovation, drive adoption, and advance the technology and infrastructure of the Metabit ecosystem. It actively collaborates with developers, partners, and industry experts to create an environment that encourages creativity and the realization of breakthrough projects.

8 Governance

MetaDAO is a decentralized autonomous organization (DAO) that governs the Metabit ecosystem using MDAO governance tokens. As the community grows, the number of proposals submitted to MetaDAO has reached 100, covering a wide range of topics and initiatives aimed at advancing the Metabit ecosystem’s development and governance.

- **MDAO:** 15% of the tokens are allocated to the MDAO (Metabit Decentralized Autonomous Organization) category. These tokens are dedicated to supporting and managing the Metabit ecosystem through community-driven initiatives.
- **Community Treasury:** 5% of the tokens are allocated to the community treasury, used for community programs, partnerships, and future development funds.
- **Airdrop:** 15% of the tokens are used for airdrops, distributed to early adopters, community members, and other participants to promote broad adoption and engagement.
- **Development Team:** 15% of the tokens are allocated to the development team to reward their efforts and incentivize the continuous development and improvement of the Metabit platform.
- **Liquidity Pool:** 15% of the tokens are allocated to the liquidity pool to provide liquidity, facilitate trading on exchanges, and ensure the healthy development of the Metabit token market.
- **Staking and Ve Mode:** 50% of the tokens are allocated to staking and Ve modes, providing efficient liquidity governance for ecosystem projects.
- **Voting Fee:** 100 MDAO tokens
- **Voting Period:** 7 days
- **Execution Period:** 3 days
- **Approval Criteria:** More than 50

8.1 Developer Grant Program

The Metabit Developer Grant Program is designed to support developers within the Metabit ecosystem. The program provides funding and resources to help developers undertake projects that contribute to the growth, innovation, and comprehensive development of the Metabit platform.

Through the grant program, developers can submit project funding proposals covering core protocol development, decentralized applications (DApps), smart contracts, tools, infrastructure, and more. The grants aim to enhance developers' capabilities and incentivize them to build and strengthen the Metabit ecosystem.

The program follows a transparent, community-driven process, with proposals reviewed and evaluated by an expert panel or decentralized voting mechanism. Evaluation criteria typically include the project's potential impact, feasibility, innovation, technical quality, and alignment with Metabit ecosystem goals. Successful applicants receive financial support, mentorship, technical guidance, and access to development tools and documentation. This grant program not only helps developers realize their ideas but also fosters a collaborative and supportive community that encourages knowledge sharing and continuous improvement. By investing in ecosystem development through the grant program, Metabit aims to attract top talent, drive innovation, and ensure the platform's long-term success and growth.

9 Community

9.1 Education

Metabit Community Education is a program dedicated to providing educational resources, projects, and opportunities to members of the Metabit community. The goal is to equip individuals with the knowledge and skills needed to actively participate in and promote the Metabit ecosystem. The education program offers various resources, including tutorials, guides, documentation, and workshops, to help community members understand the core concepts, features, and functionalities of the Metabit platform. Topics covered include blockchain technology, decentralized finance (DeFi), smart contracts, and token economics.

Through webinars, online courses, and offline events, community members can deepen their understanding of Metabit and explore its potential applications. Experienced speakers and industry experts share their insights and best practices, providing participants with practical knowledge and updates on the latest developments in the field. Additionally, the education program encourages collaboration and knowledge sharing within the community. It creates a supportive environment where members can engage in discussions, ask questions, and learn from each other's experiences. This collaborative approach fosters a strong and informed community that can collectively advance the development and adoption of Metabit.

By investing in community education, Metabit aims to build a knowledgeable and capable community that can actively engage with the ecosystem, drive innovation, and unlock the full potential of the Metabit platform.

10 Development Roadmap

2024 - Q3: Brand Upgrade Metabit will undergo a comprehensive brand upgrade, enhancing the UI of the official website, wallet, DEX, and nodes. The user interaction process will be optimized to improve user experience and interface aesthetics. Market promotion activities will showcase the new brand image and technical advantages, enhancing brand influence and recognition.

2024 - Q4: DePIN and DeAI Infrastructure Integrate idle GPU resources from the ETH PoS transition,

GPUs purchased by Metabit, and community-contributed edge computing resources to establish and optimize DePIN’s resource allocation mechanism. Initiate the training of initial AI models using blockchain transaction data, exchange data, and community-contributed data. Launch basic DApp projects focusing on AI investment advisors and basic virtual assistants.

2025 - Q1: Strengthening AI Integration Expand AI models in the DeAI layer to include multimodal capabilities (text, image, video, and audio recognition and generation). Implement a community annotation incentive mechanism where participants can earn tokens by contributing and verifying data, enhancing the accuracy and effectiveness of AI models. Develop more advanced DApps offering personalized financial planning and real-time market analysis.

2025 - Q2: Integration and Optimization Optimize DePIN algorithms for dynamic resource allocation and efficient utilization, and introduce tiered AI services based on stake levels, where high-stake users can access advanced AI advisory models. Increase the DApp user base and continuously improve DApp interfaces and features through user feedback.

2025 - Q3: DePIN Product Launch Launch DePIN hardware that interacts with the DePIN layer, utilizing distributed computational resources to enhance AI model training and intelligent applications. Users can contribute idle computational resources through the hardware and earn token rewards, encouraging community participation and resource sharing.

2025 - Q4: Ecosystem Integration Implement the PoAI consensus mechanism across the network to improve consensus efficiency through AI-driven decision-making processes. Launch a decentralized computational market where developers can freely trade computational resources, ensuring transparency and efficiency in resource utilization. Promote close integration between DApps and DeAI, continuously optimizing AI models using real-time data from DApps.

2025 - 2026: Innovation and Expansion Establish an interaction platform between humans and AI digital agents to enhance the interactivity of intelligent applications. Integrate AI decision models into DAO governance to improve the efficiency and transparency of decentralized decision-making. Collaborate with enterprises to develop customized AI solutions, demonstrating Metabit’s commercial potential.

2027 - 2030: Building a Harmonious AI Society Seamlessly integrate AI into daily life through DApps, providing comprehensive intelligent services. Create a harmonious metaverse society where humans and AI coexist, leveraging multimodal data from user devices for intelligent decision-making and automated operations. Continuously innovate to adapt to emerging technologies and market demands, maintaining Metabit’s leadership in the blockchain and AI fields.

By following this roadmap, Metabit aims to build a robust, intelligent, and decentralized blockchain ecosystem, driving business and technological innovation while fostering a thriving user and developer community.

Disclaimer

The contents of this White Paper do not constitute an offer to sell, or the solicitation of an offer to buy, any tokens. The purpose of publishing this White Paper is solely to gather feedback and comments from the public. If Metabit offers any tokens (or a Simple Agreement for Future Tokens) for sale in the future, it will do so through definitive offering documents, including a disclosure document and risk factors. These definitive documents are expected to include an updated version of this White Paper, which may differ significantly from the current version. If Metabit conducts such an offering in the United States, it is expected to be available only to accredited investors.

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