MAAL WHITEPAPER

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Maal Blockchain ("MaalChain")

The challenges facing the blockchain industry have made it difficult for regulators, financial institutions, and governmental agencies to embrace the technology due to concerns about compliance and origination of funds. The Islamic community, which comprises approximately 1.9 billion individuals, has shown hesitancy in adopting blockchain technology due to religious beliefs centered around a lack of incorporated Maqasid Al Shariah-based principles.

MaalChain effectively addresses the challenges, concerns, and skepticism associated with existing blockchains and dApps. This is achieved through the integration of innovative Web3 technology called "Concept-of-Identity," which creates a hybrid solution through combining private dApps within a public DLT blockchain.

Making MaalChain an attractive option for entities such as governments, capital and insurance markets, and individuals who require high levels of security and privacy while delivering faster transaction processing times. Importantly, Maal uses Almutaqin consensus and adheres to Maqasid Al Shariah-based principles, ensuring that it operates according to principles of fairness, justice, and equity. The supply of Maal's native coin is fixed at 10 billion, ensuring optimal tokenomics.

The MaalChain contract library can be found at: https://docs.maalscan.io/maal-contract-library

Maal Architecture

Maal operates as a layer-2 solution leveraging the Polygon Edge framework, which is a bridged proof-of-stake blockchain designed to facilitate faster and more cost-effective transactions compared to many existing blockchains. It also offers standardized libraries that developers can utilize. Maal further enhances flexibility for developers by providing a variety of modules for creating customized blockchains with specific parameters and rules. Additionally, it seamlessly integrates with popular EVM tools and infrastructure, simplifying the development and deployment of applications on the MaalChain platform.

MaalChain is built with a three-layer architecture that ensures efficiency, scalability, and security. The first layer is the Polygon Edge, which employs a Proof-of-Stake (PoS) bridged consensus mechanism that is optimized for high-speed transaction processing. The second layer is the Bridged Oracle Relay (BOR), which reduces congestion on the MaalChain by bulk processing transactions. The third layer is the Heimdall Bridge, which synchronizes the

MaalChain and the BOR sidechain with the Ethereum blockchain, enabling the transfer of data and transactions between these blockchains. In addition, Maal supports the creation and deployment of other tokens on its blockchain using Maal-20 smart contracts.

Maal's use of the Heimdall Bridge and BOR sidechain ensures the security and integrity of data being transferred between blockchains by generating checkpoints at specific intervals (epochs). These checkpoints serve as snapshots of transactions, which are then stored and verified by the relevant blockchains to ensure the validity and accuracy of the transferred transactions. Additionally, Maal employs a Fraud Proofs mechanism, allowing users to submit information regarding any transactions that they believe to be fraudulent. This system improves transaction security by providing an additional layer of accountability and transparency to the MaalChain.

BOR (Bridge Oracle Relay)

BOR is a crucial part of the MaalChain, playing a dual role in the ecosystem. Firstly, it integrates with Maal to process transactions in bulk, reducing network congestion and accelerating transaction processing. Secondly, BOR acts as a bridge between Maal and the Polygon PoS blockchain, allowing for seamless transfer of assets and data between the two. The validators in BOR create checkpoints of BOR sidechain blocks, which are then submitted to Maal for validation and inclusion, ensuring that all validators agree on the state of the blockchain and enhancing its security.

BOR optimizes efficiency and reduces processing overhead by prioritizing transactions that pay the highest gas price and processing them in batches. Moreover, it enables cross-chain communication and data transfer between different blockchains, increasing flexibility and interoperability for Maal. With support for multiple shard chains, BOR facilitates decentralization, reduces transaction costs, and promotes cross-chain interactions, leading to improved scalability, security, and efficiency of Maal.

Heimdall Bridge

The Heimdall Bridge is a critical component in ensuring reliable and secure digital asset transfers between BOR, Ethereum, and MaalChain (MaalChain). It acts as a checkpoint manager, connecting Ethereum and the Polygon PoS blockchains and uses a decentralized network of validators to create checkpoints on Maal that reference the state of the Ethereum blockchain at a specific time. These checkpoints are essential for maintaining the accuracy and integrity of transactions across different blockchains. Checkpoints are created using Merkle tree structures,
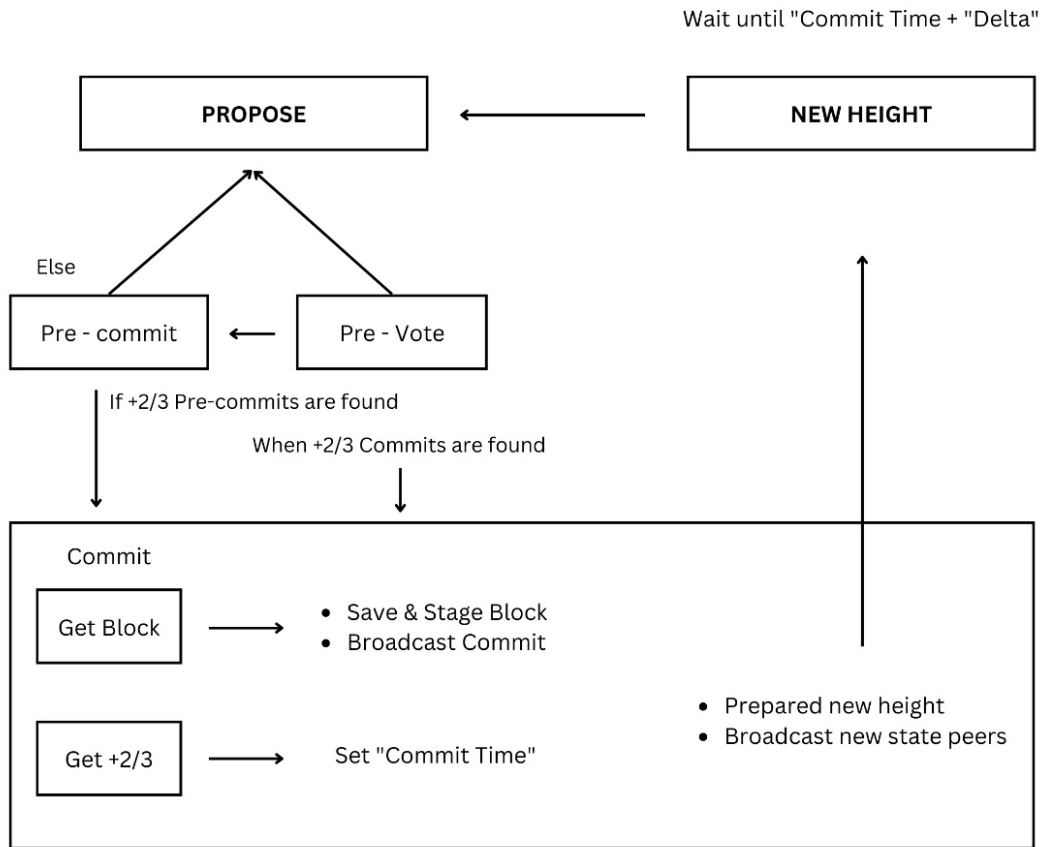
which are then submitted to the MaalChain through the RootChain gatekeeper node, ensuring that all validators agree on the state of the blockchain at the end of each epoch.

In addition to creating checkpoints on Maal, the Heimdall Bridge also creates checkpoints on BOR to verify transaction accuracy and integrity across different blockchains. This feature helps prevent any loss or damage to digital assets, making the Heimdall Bridge a trustworthy solution for secure digital asset transfers.

Beyond its checkpoint functionality, the Heimdall Bridge supports smart contracts across multiple blockchains, creating possibilities for decentralized finance and other use cases for MaalChain. Its proof-of-burn mechanism further enhances security and efficiency when withdrawing assets from the MaalChain.

Consensus and Block Creation Process

The Maal consensus process follows a round-robin iteration where a proposer is selected to lead the consensus, and validators are chosen based on their voting power. The proposal involves multiple stages, including "propose," where the proposer communicates the proposed block to peers. Validators sign votes for blocks, with a 2/3 majority "commit" signifying that the block is committed. The protocol consists of propose, pre-vote, and pre-commit steps, with commit and new height as special steps. Each step takes one-third of the total time allocated for the round, with each round lasting slightly longer than the previous one. The increase in duration helps the blockchain reach consensus in a partially synchronous environment, with timeouts and fallback mechanisms used to prevent the consensus process from stalling. The schematic of the validation process is below:

```
           ┌──────────────────┐           ┌──────────────────┐
           │     PROPOSE      │ ◀──────── │    NEW HEIGHT    │
           └──────────────────┘           └──────────────────┘
                   ▲
       Else      ╱   ╲
        ┌──────────┐  ┌──────────┐
        │Pre-commit│◀─│ Pre-Vote │
        └──────────┘  └──────────┘
```

If +2/3 Pre-commits are found

When +2/3 Commits are found

Commit

| Get Block | ⟶ | • Save & Stage Block
• Broadcast Commit |

• Prepared new height
• Broadcast new state peers

| Get +2/3 | ⟶ | Set "Commit Time" |

Blocks within Maal are created using validated transactions and specific structures. Merkle trees are used to hash validation and transaction hashes to produce root hashes, which are then used to compute the block hash. The Maal state hash, which is also a Merkle root hash, represents the persistent account state external to Maal. The block hash in Maal is computed by hashing the header, validation, and transaction hashes together, resulting in a Merkle root hash. All transactions within a block must be valid, and sufficient signatures must be included in the validation to be valid in Maal. This approach ensures blockchain integrity and prevents unauthorized changes to transaction data and account state. Validators play a crucial role in ensuring the security and integrity of both Maal and BOR by proposing blocks, signing votes, and committing blocks to the blockchain.

Validators

MaalChain runs on Proof of Stake "PoS" consensus mechanism which requires validators that perform critical roles in ensuring the smooth operation of the MaalChain by acting as both block producers and verifiers of transactions. The minimum technical specifications for a MaalChain node are:

Type	Value	Influenced by
CPU	4 cores	Number of JSON-RPC queries Size of the blockchain state Block gas limit Block time
RAM	16 GB	Number of JSON-RPC queries Size of the blockchain state Block gas limit
Disk	1 TB SSD	Size of the blockchain state

Setting up and managing a validator node can prove to be a complex and time-consuming endeavor, deterring some individuals from participating. In response to this challenge, Maal aims to ease the burden on its validators by offering a dedicated node service. Maal will establish, configure, and oversee this node on behalf of the validator. The node will adhere to the following specifications, with Maal taking full responsibility for its operation and maintenance. Furthermore, all costs associated with operating and sustaining these validator nodes will be absorbed by the Maal treasury, thereby alleviating financial obligations for the validators in this regard. Allowing validators through the DAO to have control over validator rewards without having to worry about running a node themselves.

Validation on the MaalChain will be undertaken by 150 DAO MaalChain validators. Validators are required to pass a KYC verification before becoming a validator. Only 150 of these NFTs will be minted and distributed to the qualifying 150 DAO validators. The purchase price of the Maal coins will vary with the pre-listing period and then after prevailing market rates. These 150 DAO validators will be divided in 3 tiers as shown below:

Ranking of Validators and Qualifications in Three Tiers

Tier	Number of Maal Coins	Max No of validators
1	14,285,714	10
2	2,500,000	40
3.	222,222	100
Total		150

Within each tier, the validators will be ranked based on the number of Maal coins staked on MaalChain. The top tiered and top ranked validator, having the highest staking, will have the largest influence over the DAO governance and hence MaalChain. DAO validator membership and rights are confirmed through ownership of a MaalChain validator NFT. Validators are required to operate in alignment with Sharia principles that will be enforced through the DAO governance mechanism. Validators receive rewards for their services, including transaction fees and staking pool rewards, as well as opportunities for networking and business development that are distributed through the DAO.

A validator can own more Maal coins than required for their minimum validator staking requirement. The more coins will improve the ranking within the tier but not move the validator to a higher tier. To move to a higher tier, the validator can either apply for a higher tier DAO validator membership or purchase the membership from another validator according to the prevailing rules on ownership transfer. Example scenario below:

> If an individual purchases a tier III NFT by vesting 222,222 Maal coins (subject to KYC verification approval), they are granted tier III validator rights within the Maal Validator DAO. Now in a scenario where the same person decides to enhance their validator NFT by adding an additional 3,000,000 Maal coins and vests them. This would raise their total Maal coin holdings to 3,222,222, surpassing the threshold for a tier II validator NFT.

> However, it's essential to note that despite having a higher coin holding than a typical tier II validator NFT, this person cannot migrate to tier II status. Their status will remain within tier III. They can, however, attain the top rank within tier III if all other 99 validators within tier III hold fewer than 3,222,222 Maal coins.

DAO validator NFTs are eligible for transfer after a 5-year vesting period from the date of issue and can be bought by other validators. Selling a MaalChain DAO validator must be offered first to other DAO validators, prior to selling on the market. However, before transfer of an NFT can occur, the proposed buyer must pass KYC verification. In cases where the NFT owner is unable to sell their NFT to another validator, they retain the option to liquidate their Maal coins at the prevailing market rate. During this time, the NFT temporarily falls under the control of the DAO, ensuring continuity and network stability until a suitable sale opportunity arises.

DAO Governance

The MaalChain Validator DAO relies on smart contracts deployed on the MaalChain to execute governance. These smart contracts are responsible for minting and distributing Maal Validator NFTs to owners, managing proposals and voting mechanisms for governance decisions, calculating, and distributing profit sharing revenue to wallets of validators, and handling dispute resolution within the DAO.

The DAO allows validators to participate in voting procedures pertaining to the ongoing development and governance of the MaalChain. Maal validator NFTs are voting tokens used on the DAO for voting on proposals. These proposals encompass fundamental aspects such as network upgrades, modifications to consensus rules, and other pivotal determinations.

Proposals are subject to predefined quorum and a majority vote threshold, ensuring that only changes with broad support are implemented. The degree of voting influence given to each validator corresponds to their assigned tier and ranking, guaranteeing that those with the highest stakes wield more voting power. This system ensures fairness and proportionality in the voting process. The voting system is structured with an aggregate of 1,000 votes as follows:

- Tier 1 validators have 50 votes each for each 10 validator NFT memberships, contributing to an aggregate weightage of 500 votes.

- Tier 2 validators have 10 votes each, apportioned across 40 validator NFT memberships, contributing to an aggregate weightage of 400 votes.

- Tier 3 validators have 1 vote for each of their 100 validator NFT memberships, contributing to an aggregate weightage of 100 votes.

In situations where a DAO vote proposal receives an equal number of votes in favor and against, the ultimate decision will be determined by assessing the proportional Maal coin holdings of both proponents and opponents of the proposal.

DAO Revenue Sharing

One of the central functions within the MaalChain Validator DAO pertains to profit sharing. The DAO accrues profit sharing through transaction fees originating from the Maal income generating ecosystem that includes MaalChain, RamzSwap, PanSea NFT Marketplace. This profit sharing will be collected in a DAO controlled treasury wallet and disbursed semi-annually among the 150 validators, with distribution based on their respective tiers and coin holdings.

The DAO distribution process is automated through smart contracts deployed on the MaalChain, ensuring transparency and equity.

It is important to note that all validators share a collective risk, as there is an initial waiting period of 12 to 18 months from the commencement of the Maal income generating ecosystem before revenue becomes available for distribution. This timeline aligns with the successful precedents set by other blockchain networks.

Example of DAO Validator Profit Sharing		
MaalChain transaction Fee	$0.05	
MaalChain transactions	500,000,000	
Gross Revenue	$25,000,000	
Deduct Opex 40%	($10,000,000)	
EBITDA	$15,000,000	
Validator Pool shared risk and profit @21%	$3,150,000	
Distribution Ratio and Profit Share for Tier 1	50%	$1,575,000
Distribution Ratio and Profit Share for Tier 2	40%	$1,260,000
Distribution Ratio and Profit Share for Tier 3	10%	$315,000

DAO Security

To safeguard the security and integrity of the MaalChain Validator DAO, a series of security measures will be implemented, encompassing:

- Utilization of multi-signature wallets for significant transactions and fund management.

- Periodic security audits of the smart contracts, conducted by independent experts.

- Implementation of a robust dispute resolution mechanism to effectively address conflicts or disputes that may emerge within the DAO.

- Maintenance of a transparent and publicly accessible ledger, chronicling all DAO activities and decisions on the MaalChain blockchain.

Concept of Identity

Skepticism within the blockchain industry arises from challenges related to identifying wallet address owners and the inability to trace fund origins. MaalChain, in conjunction with its approved wallets, effectively mitigates these concerns by introducing the capability to recover

digital assets through biometric facial recognition, eliminating the need for cumbersome seed phrases. This is made possible through the implementation of the Concept-of-Identity.

The Concept-of-Identity on MaalChain not only offers security to wallet addresses but can facilitate ownership identification of wallets for specific applications and allow private dApps to be combined within a public DLT blockchain. This provides an avenue to achieve regulatory compliance necessary for MaalChain adoption by central banks, financial institutions, and government organizations to name a few where the owner identity of a wallet address is necessary. Additionally, providing the opportunity to ensure Shariah compliance for dApps and supply chain management.

- Most secure wallet for all Digital Assets.
- NPC. No more Lengthy seed phases or private keys.
- No additional hardware required.
- Face scan and biometric authentication is all you need to recover.
- Centralized. Keep all your decentralized digital assets, one wallet.

Detection + Normalization + Representation + Extraction + Matching
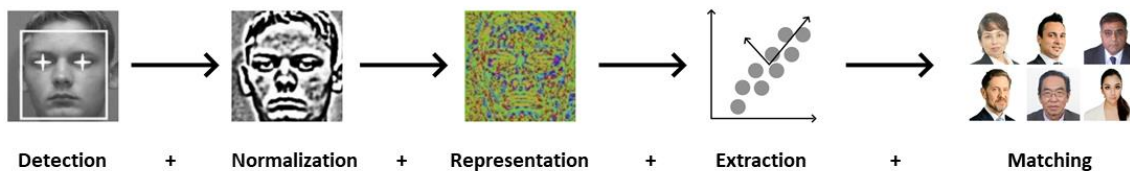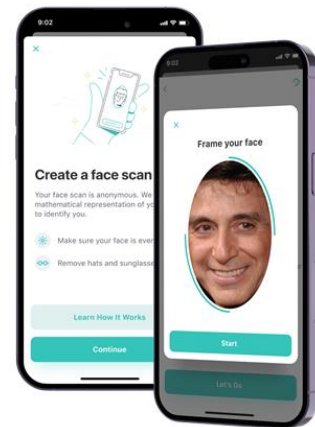
Tokenomics

Tokenomics for MaalChain is a term that encapsulates the economic principles governing Maal coin and encompasses a wide array of factors that influence Maal coin's utility, value, and overall behavior within MaalChain. The tokenomics is designed to ensure the long-term success and sustainability of MaalChain ecosystem to maximize the value of Maal coin.

Utility

- Maal serves as the primary currency for transaction fees within the Maal blockchain, incentivizing network security and stability.

- Staking for Validators: Validators must stake Maal to participate in the consensus mechanism, ensuring network security. Tiered staking requirements (Tier1, Tier 2, Tier 3) with varying rewards.

- Governance: MaalChain Validator DAO executes governance relating to submission of proposals and voting mechanisms relating to the MaalChain network and distribution of profit sharing to validators. The provides on chain transparency and ensures fairness.

- Access to Maal ecosystem: Maal grants access to various services and applications within the Maal ecosystem, including RamzSwap (decentralized exchange), PanSea (NFT Marketplace), Ramz Launchpad (reserve locking and listing of tokens), Ramz MarketCap (listing of tokens), and future dApps.

Distribution

- Initial Distribution includes an initial private sale of Maal coins incentivizing early supporters and contributors. MaalChain Validator DAO Maal sale proceeds fund MaalChain ecosystem development. This Maal coins are vested for 5 years.

- Validators and stakers receive block rewards and transaction fees for securing MaalChain distribute through the MaalChain Validator DAO.

- Community rewards program for active MaalChain community members, contributors, and developers to foster MaalChain ecosystem growth and engagement.

- Ecosystem development fund is an allocation of Maal coins dedicated to funding projects, partnerships, and ecosystem growth.

- Liquidity pools for Maal on decentralized exchanges to provide liquidity and encourage trading.

Vesting

Team members and advisors are required to vest received Maal coins. Advisors vesting period is 2 years and team members is 3 years. This acts as encouragement for team members and advisors to align their interests with long-term MaalChain success.

Adaptability

The MaalChain Validator DAO permits validators to vote on MaalChain parameter adjustments, block rewards, staking requirements, and to adapt to changing market conditions to ensure long
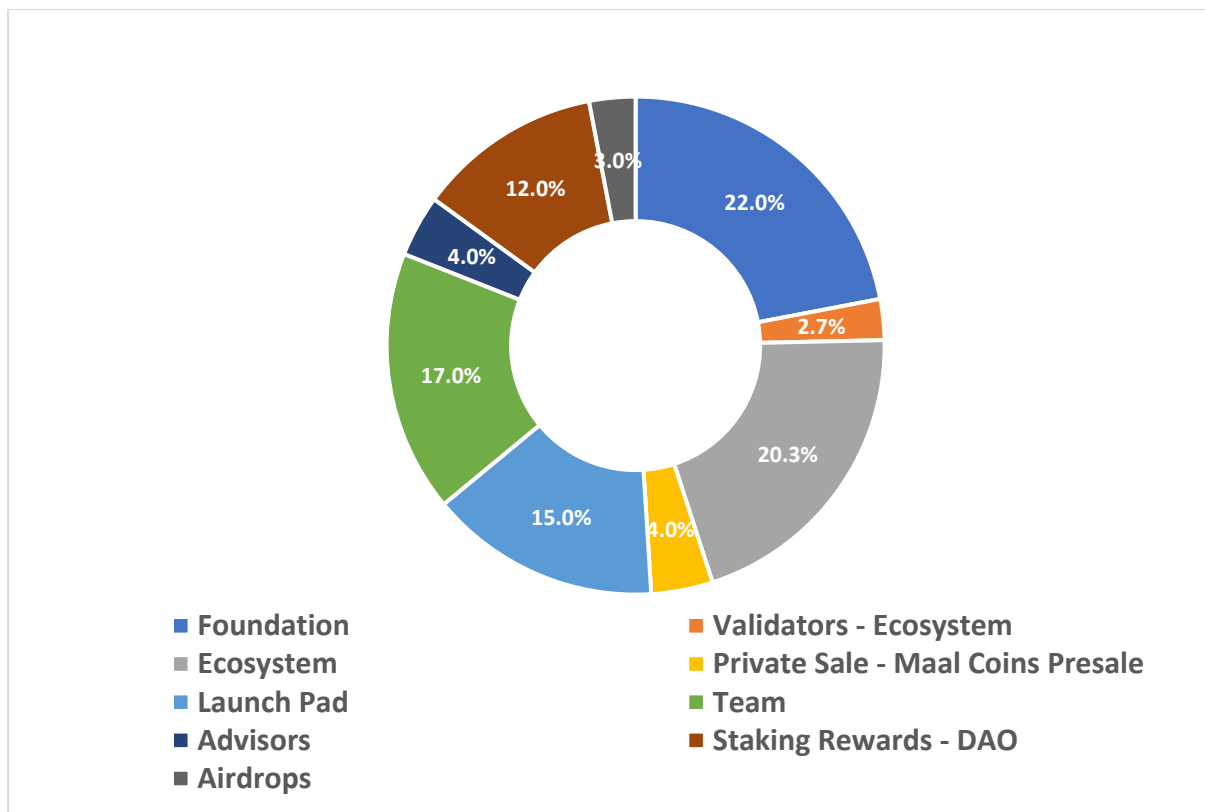
term success of the MaalChain ecosystem. The DAO empowers validators to propose and vote on changes to tokenomics, fostering decentralization and consensus-driven decision-making.

Transparency and Reporting

The Maal Foundation will regularly publish reports on tokenomics, including token distribution, supply changes, and ecosystem development fund utilization. It will maintain an open dialogue with the community, seeking feedback and improving MaalChain ecosystem.

Allocation

The token allocation strategy for Maal Blockchain offers several advantages. It provides financial support, incentivizes key participants, jumpstarts network activity, and ensures long-term commitment from stakeholders. Additionally, it encourages ecosystem growth and decentralization, ultimately contributing to the blockchain's success and sustainability. The allocation of Maal coins is restricted to a total supply of 10 billion.

Legend:
- Foundation
- Validators - Ecosystem
- Ecosystem
- Private Sale - Maal Coins Presale
- Launch Pad
- Team
- Advisors
- Staking Rewards - DAO
- Airdrops

Token Allocation	%	Maal Coins	Initial Circulating Supply	Locking (Years)
Foundation	22.0%	2,200,000,000	-	5 recurring
Validators - Ecosystem	2.7%	265,079,365	265,079,365	5 recurring*
Ecosystem	20.3%	2,034,920,635	-	5 recurring
Private Sale - Presale	4.0%	400,000,000	-	5
Launch Pad	15.0%	1,500,000,000	1,500,000,000	0
Team	17.0%	1,700,000,000	-	3
Advisors	4.0%	400,000,000	-	2
Staking Rewards - DAO	12.0%	1,200,000,000	1,200,000,000	5
Airdrops	3.0%	300,000,000	300,000,000	0
Total	100.0%	10,000,000,000	3,265,079,365	

*Validators could sell after 5-years however, these coins would then be locked by the buyer of the validator NFT, or if liquidated the coins would be held within the DAO and not circulated.

- Foundation (22.0%) substantial token allocation provides long-term financial support for the development, maintenance, and growth of the Maal blockchain ecosystem. It ensures that resources are available for ongoing innovation and sustainability.

- Validators - Ecosystem (2.7%) allocation to validators and the broader ecosystem incentivizes network security and participation. Validators play a crucial role in maintaining the integrity of the blockchain, and this allocation ensures their ongoing commitment.

- Ecosystem (20.3%) a sizable allocation for the ecosystem allows for the development of various dApps, services, and partnerships within the Maal blockchain. This fosters a vibrant and diverse ecosystem, attracting users and developers.

- Private Sale - Presale (4.0%) generate early capital and support from strategic investors. These funds will be channeled into MaalChain ecosystem development, providing a solid financial foundation.

- Launch Pad (15.0%) a significant portion of tokens to a launch pad incentivizes early adopters and users. It jumpstarts network activity and liquidity, driving initial growth and ecosystem expansion.

- Team (17.0%) is an incentive for talent recruitment and retention. It aligns team members' interests with the project's long-term success, ensuring their dedication and commitment.

- Advisors (4.0%) acknowledge their expertise and guidance. It encourages their active involvement and contributions to the project, enhancing its strategic direction.

- Staking Rewards - DAO (12.0%) to the community via DAO participation promotes MaalChain ecosystem development and network security. It ensures that the blockchain has a robust and active validator community.

- Airdrops (3.0%) distribution used for marketing, generate initial interest, engagement, and adoption of the MaalChain to attract a diverse and active user base.

Locking

The token locking strategy in MaalChain offers several advantages, signals long-term commitment, reduces supply volatility, and fosters investor confidence. Additionally, it strikes a balance between long-term commitment and short-term flexibility, ensuring MaalChain ecosystem sustainability and adaptability.

Locked	Allocation	% of Total Supply	Circulating Supply	% of Total Supply
5-years recurring*	4,500,000,000	45%	265,079,365	3%
5-years	1,600,000,000	16%	1,200,000,000	12%
3-years	1,700,000,000	17%	-	0%
2-years	400,000,000	4%	-	0%
not locked	1,800,000,000	18%	1,800,000,000	18%
Total	10,000,000,000	100%	3,265,079,365	33%

- 5-years recurring (45%), the majority of Maal coins are locked for a recurring 5-year period (45%) demonstrates a long-term commitment to ensure MaalChain ecosystem success. The aim is to provide stability to the MaalChain ecosystem by reducing the risk of sudden coin dumps by the founders.

- 5-years (16%) a substantial portion of Maal coins locked for 5 years (16%) aligns incentives with long-term success. This is to assure investors and the community that MaalChain is focused on sustainable growth rather than short-term gains.

- 3-years (17%) the team are incentivized to ensure a meaningful commitment to the MaalChain ecosystem as this significant portion of the supply remains inaccessible. This helps maintain price stability and investor confidence.

- 2-years (4%) although a smaller portion, these Maal coins demonstrate a commitment to the project's initial growth phase. It provides a measure of stability during the early stages of the ecosystem's development.

- Not locked (18%) it is necessary to have a portion of Maal coins not locked to provide liquidity within the ecosystem. These Maal coins can be used for immediate ecosystem development, partnerships, and addressing short-term needs without relying solely on the locked supply.

Conclusion

MaalChain stands as a formidable tool poised to redefine the global landscape of business and interaction. It champions trust, security, and efficiency while adhering to ethical principles, marking a pivotal moment in the blockchain industry's evolution. MaalChain: the catalyst for a new era of blockchain excellence.

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