



JACKAL PROTOCOL ECONOMICS

VERSION 2.0

NOVEMBER 2023

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Jackal is an open-source protocol that will allow operation of a blockchain network to be known as the Jackal Protocol. The Jackal Protocol is under development and subject to change. As such, the protocol documentation and contents of this document may not reflect the current state of the protocol at any given time.

The protocol documentation and document content are not final and are subject to change.

ABSTRACT

The pioneering debut of the Jackal Protocol, has ushered in a transformative era of interoperable, decentralized, and private data storage underpinned by on-chain permissions. As Jackal evolves from its nascent proof of concept phase to a robust, enduring platform, the community underscores the urgency to revisit and hone its economic foundations. This document delineates a comprehensive strategy not only to bolster the Jackal Protocol's growth trajectory but also to elevate the significance of its native token, all while forging an adaptable economic blueprint for future evolution.

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INTRODUCTION

The Jackal Protocol emerged as a pioneering force, demonstrating the feasibility of interoperable, decentralized, and private data storage with on-chain permissions. The platform stands on the brink of significant expansion in storage capacity and broader adoption, with the essence of Jackal's innovative storage solutions with an unwavering commitment to protocol enhancement. Forward-thinking organizations re-calibrate economic strategies in response to shifting landscapes. The Jackal Protocol is no different, necessitating regular adjustments to maintain harmony between technical prowess and the community's evolving needs.

Initially, the economic model of the JKL token was crafted before the protocol's launch, with a focus on decentralization, and initiating a proof of concept. This foundational groundwork set the stage for a thriving protocol and an engaged, growing community. Decentralized environments are known for dynamism and ever changing landscape and there has been a wealth of insights gathered post-launch. Armed with this new knowledge and a refined perspective, the opportunity now lies in addressing unforeseen challenges. The spotlight has shifted from merely establishing Jackal's functionality to actively promoting its widespread adoption, new found applications, and interoperability.

To ensure sustainability in this evolving landscape, a thorough evaluation of the protocol's financial dynamics and a balanced approach to revenue and expenditure is paramount. Jackal's primary mission is to increase the unique data stored on its platform and catalyze the development of novel applications. In alignment with this, a comprehensive economic restructuring has been undertaken. The refreshed economic model incorporates decentralized commissions, intuitive discount systems, and dynamic algorithms to direct resource allocation, ensuring seamless scalability without superfluous costs. Detailed attention has been given to inflation—a core strategy for distributing protocol expenses—to ensure it's optimally calibrated. A financial strategy has been designed with precision to direct real yield protocol profits towards bolstering protocol-owned liquidity and storage providers. This paves the way for broader accessibility, appealing returns, and expected cost efficiencies. Furthermore, it reinforces the intrinsic value of the JKL token by tying its demand directly to the protocol's widespread acceptance.

REFLECTION ON VERSION 1 ECONOMICS.

REFLECTION ON VERSION 1 ECONOMICS

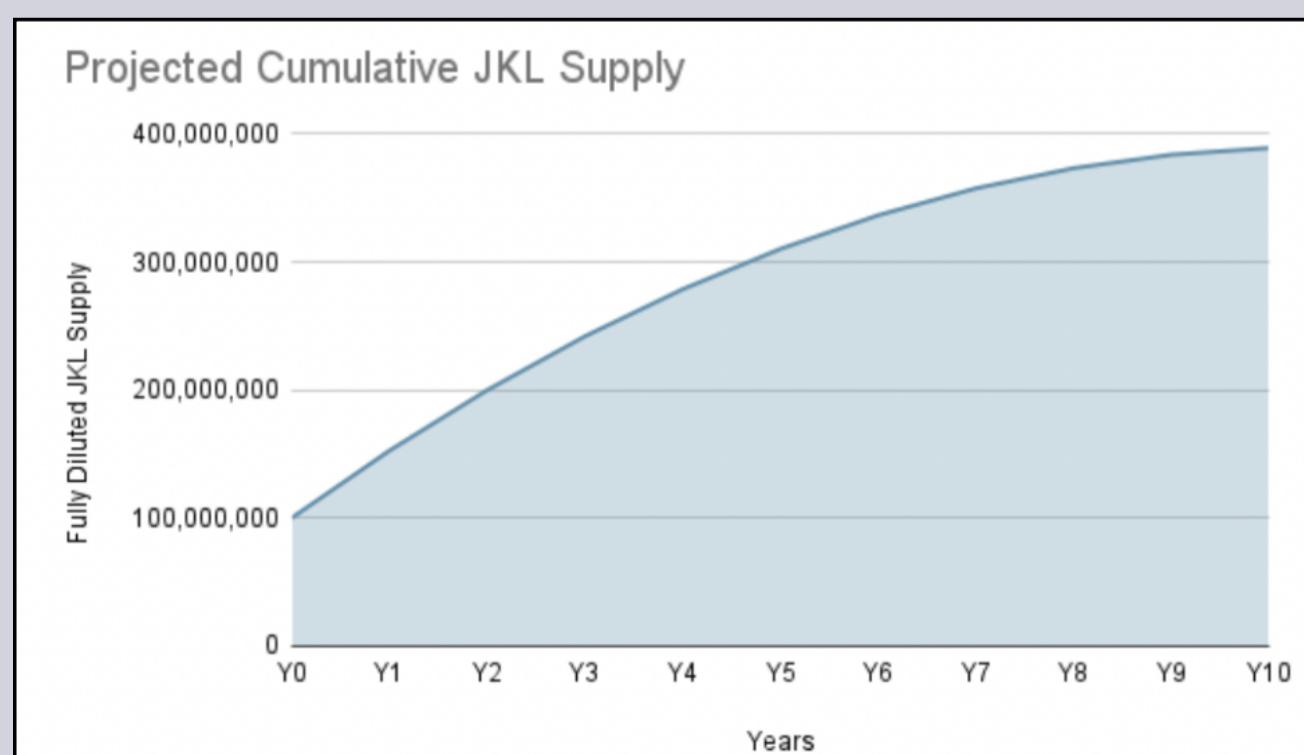
For a comprehensive grasp of the transformation, it's essential to first delve into the beginnings. The initial framework was strategically designed to promote the widespread distribution of the JKL token. The primary objectives were to validate the proof of concept, fortify and ensure stability for the chain, and set the stage for storage providers.

Given the nascent stage of the protocol, substantial early incentives were deemed necessary, resulting in operating deficits – a common trait for young protocols. The successful realization of this wide token distribution and the validation of the Jackal Protocol concept is what grants the community this privilege to revisit and refine the model today.

Historically, the JKL economics adopted a diminishing emissions strategy. This ensured advantageous returns from staking and rewards for infrastructure provision. With the intention of tapering these benefits over time, the model previously prescribed a reduction in the tokens minted per block by 1 annually, starting from an initial rate of 10.

This gave rise to a specific inflationary trajectory and a multi-year aggregate supply breakdown as described below.

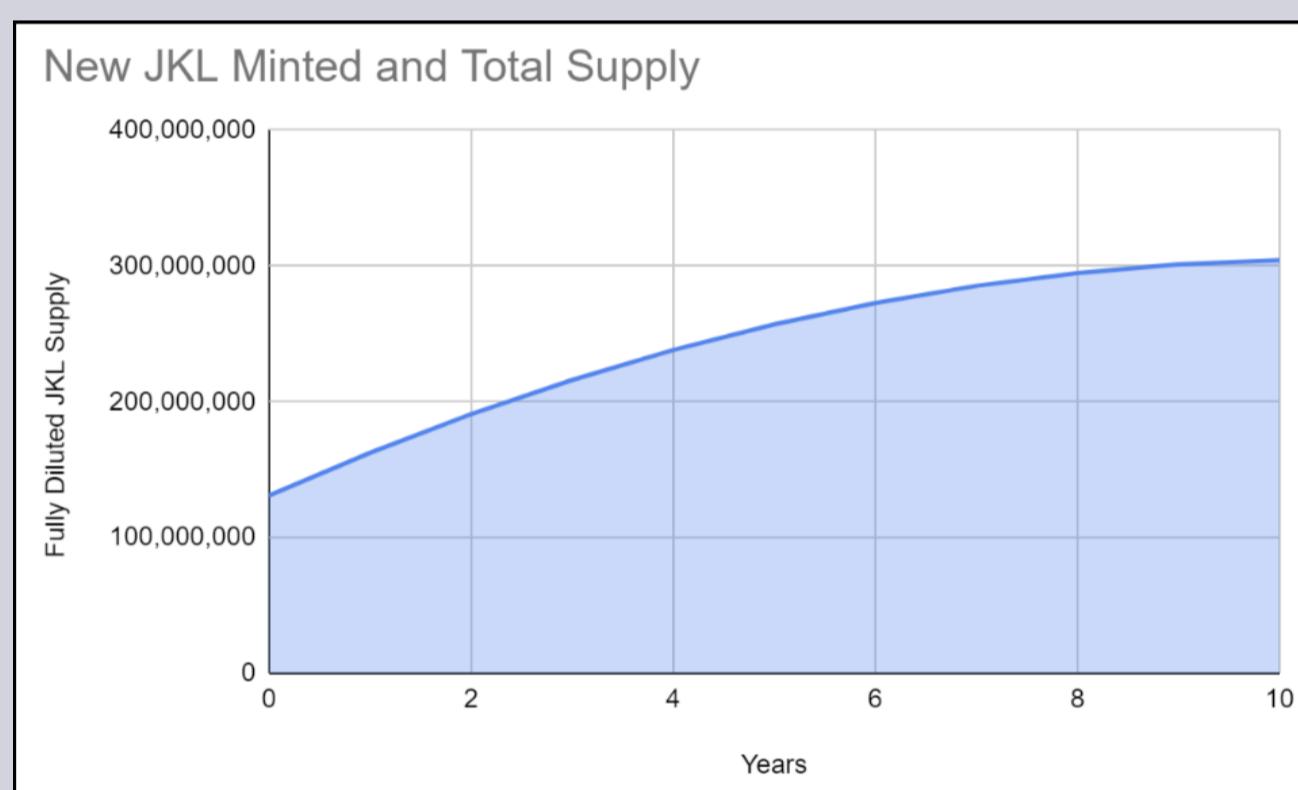
| Year | New \$JKL Minted | Total Supply | Projected Inflation | Minted Tokens/Block |
|------|------------------|--------------|---------------------|---------------------|
| I | 52,560,000 | 152,560,000 | 53% | 10 |
| II | 47,304,000 | 199,864,000 | 31% | 9 |
| III | 42,048,000 | 241,912,000 | 21% | 8 |
| IV | 36,792,000 | 278,704,000 | 15% | 7 |
| V | 31,536,000 | 310,240,000 | 11% | 6 |
| VI | 26,280,000 | 336,520,000 | 8% | 5 |
| VII | 21,024,000 | 357,544,000 | 6% | 4 |
| VIII | 15,768,000 | 373,312,000 | 4% | 3 |
| IX | 10,512,000 | 383,824,000 | 3% | 2 |
| X | 5,256,000 | 389,080,000 | 1% | 1 |



In light of community concerns regarding the gamification of storage incentives, the protocol's governance took decisive action. Storage provider rewards were recalibrated and the mint module was altered to reduce tokens minted by 40% of the initial projected inflation. This led to an effective minting rate of 6 JKL per block, dedicated solely to staking rewards.

From this juncture, the revised estimates for circulating supply and inflation are delineated as follows:

| Year | New JKL Minted | Total Supply | Projected Inflation | Tokens per Block |
|------|----------------|--------------|---------------------|------------------|
| 1 | 31,536,000 | 162,458,552 | 24.09% | 6.00 |
| 2 | 28,382,400 | 190,840,952 | 17.47% | 5.40 |
| 3 | 25,228,800 | 216,069,752 | 13.22% | 4.80 |
| 4 | 22,075,200 | 238,144,952 | 10.22% | 4.20 |
| 5 | 18,921,600 | 257,066,552 | 7.95% | 3.60 |
| 6 | 15,768,000 | 272,834,552 | 6.13% | 3.00 |
| 7 | 12,614,400 | 285,448,952 | 4.62% | 2.40 |
| 8 | 9,460,800 | 294,909,752 | 3.31% | 1.80 |
| 9 | 6,307,200 | 301,216,952 | 2.14% | 1.20 |
| 10 | 3,153,600 | 304,370,552 | 1.05% | 0.60 |



The initial allocations and vesting schedules still in effect are shown as follows:

| Group | Launch Circulation | Vesting Total | Year 1 Total Vested | Year 2 Total Vested | Year 3 Total Vested | Year 4 Total Vested | Launch Allocation |
|--|----------------------|---------------|---------------------|---------------------|---------------------|---------------------|-------------------|
| Development Entity | 24,900,000 | 24,900,000 | 6,225,000 | 12,450,000 | 18,675,000 | 24,900,000 | 24.9% |
| Core Employees & Contractors | 4,100,000 | 4,100,000 | 1,025,000 | 2,050,000 | 3,075,000 | 4,100,000 | 4.1% |
| Pre-Seed Funding | 1,000,000 | 1,000,000 | 500,000 | 1,000,000 | | | 1% |
| Seed Funding | 7,500,000 | 7,500,000 | 3,750,000 | 7,500,000 | | | 7.5% |
| Advisors | 2,000,000 | 2,000,000 | 500,000 | 500,000 | 500,000 | 500,000 | 2% |
| Airdrop | 5,000,000 | | | | | | 1.67% |
| Dex Liquidity | 500,000 ¹ | | | | | | 0.5% |
| Launch Expenses & Incentivized Testing | 500,000 | | | | | | 0.5% |
| Grants and Bounties | 17,000,000 | 17,000,000 | 5,666,666.67 | 11,333,333.33 | 17,000,000 | | 17% |
| LP Rewards | 15,000,000 | | | | | | 15% |
| Fundraising Remainder | 10,000,000 | | | | | | 10% |
| Community Pool | 12,500,000 | 12,500,000 | 4,166,666.67 | 8,333,333.33 | 12,500,000 | | 12.5% |
| Total | 100,000,000 | 69,000,000 | | | | | 100% |

Table 3: Token Distributions

V1 VULNERABILITIES

The previous model of Jackal Protocol economics has revealed several vulnerabilities and inaccuracies in production. Given the inherently sovereign and decentralized architecture of the Jackal Protocol, accurately gauging the storage availability across different providers poses a significant challenge. Additionally, there have been instances where storage providers have manipulated storage incentives, storing null data on their servers.

While there's an evident necessity to incentivize a diverse set of storage providers to bolster decentralization and fortify the Jackal Protocol, the model's approach was indiscriminate. Providers received standardized rewards irrespective of performance or volume of storage provided. This opened doors to potential exploitation. Certain actors found it profitable to manipulate storage providers, whereas those contributing in good faith bore financial setbacks.

V1 SUSTAINABILITY

One of the pressing matters was the protocol's long-term viability. According to storage provider surveys, operational costs of providing hot storage to the protocol varied between \$3/TB/Month and \$7/TB/Month, while protocol pricing stood at \$8/TB/Month.

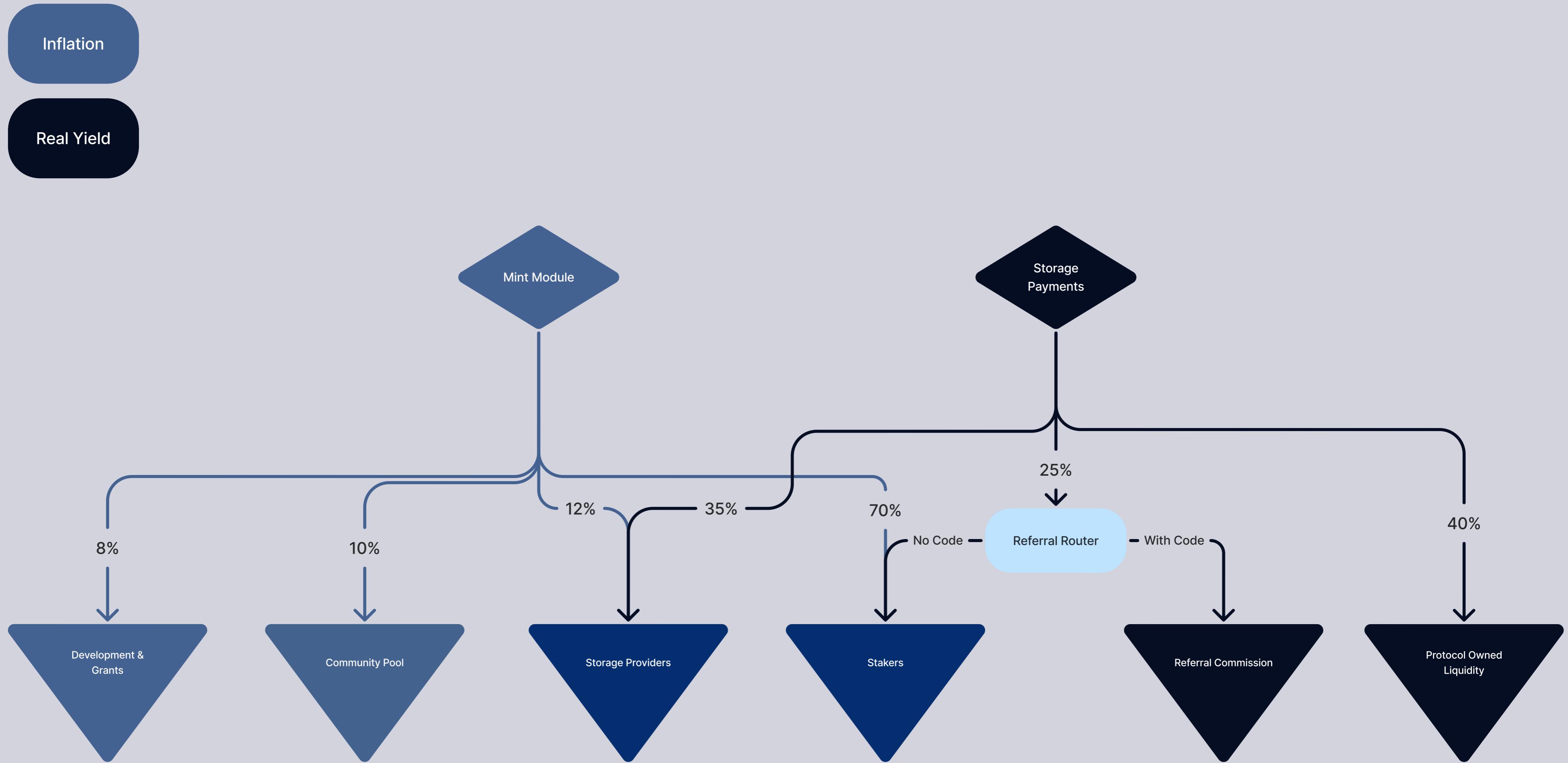
This pricing structure, though seemingly promising a profit margin of up to \$1 per unit, faced challenges when actual unit margins plummeted to as low as 4% based on the ratio of units sold to units available. Such slender margins posed substantial constraints on the protocol's profitability prospects.

The Jackal blockchain currently boasts 93 active validators, which, given the current security requirements, maybe more than necessary. Historically, the emphasis was on ensuring protocols maintained a financially rewarding environment for node operators.

However, such a paradigm is increasingly being perceived as economically unsustainable in the contemporary blockchain landscape. While the protocol ardently advocates for community members to operate their own nodes, it's plausible that certain security-related expenditures could be streamlined without detrimentally affecting the protocol's integrity.

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OVERVIEW



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Jackal offers a unique availability, speed, and on-chain permissions that is unparalleled by prior solutions. Achieving this distinct edge doesn't come at a meager cost, especially when compared with conventional, rudimentary blockchain based data storage systems. For the Jackal Protocol to flourish sustainably, it's imperative to strike a balance: setting storage pricing at a juncture that fosters profitability while ensuring fluid growth. This entails a holistic understanding of foundational costs, profit margins per unit, and operational expenditures.

Data voluntarily shared by active Jackal storage providers illustrates an average storage cost per TB, spanning from \$2.80 to \$7. Intriguingly, the more competitive rates are typically offered by bulk storage entities. Relying solely on this cost range might inadvertently alienate smaller storage providers. Just as the Nakamoto coefficient is crucial for assessing validator decentralization, redundancy and storage provider decentralization are pivotal for the decentralized storage network's robustness. Concentrating storage across a few primary providers could render them centralized choke points of failure, introducing systemic risks to users and the protocol.

In the data storage sphere, supply precedes sales. It's incumbent on the protocol to perpetually ensure that available storage eclipses the storage purchased. However, there's an inherent challenge: ensuring perpetual profitability in provisioning an ever-expanding storage space, especially when it surpasses genuine demand.

Given the decentralized structure, eschewing a traditional centralized sales force means carving out a pathway for a decentralized sales initiatives. The importance of outreach and user acquisition cannot be understated; these are the lifeblood driving protocol revenue, which underpins the sustainability of the Jackal Protocol.

The revamped model is geared towards ushering the Jackal Protocol into a profitable era. It underscores the significance of storage space purchased, advocates for re-calibrated pricing to fine-tune protocol revenue margins, and reshapes the game theory mechanics to ensure optimal unit profitability.

The inflation trajectory will be altered to curb immediate costs while better accounting for potential future expenditures. The ultimate vision for this model is to cultivate resources for upcoming applications and integrations, prioritize adeptly, and instill flexibility. This makes protocol modifications seamless and tailored to evolving objectives and requisites.

INFLATION FRAMEWORK

This economics upgrade will take the opportunity to modestly adjust the JKL inflation curve and reallocate resources with a robust inflation distribution framework. This forward-thinking approach, emphasizing deferred benefits, proposes a 30% reduction in the number of JKL tokens minted per block, revising it from the current 6.0 tokens per block to 4.2. By reducing the rate of inflation, the protocol can reserve more substantial tail emissions for future costs, adopting a conservative stance in the present.

Mint Decrease Parameter

The Jackal Protocol will be introducing a 'Mint Decrease' parameter. This parameter will enable a gradual, continual reduction in inflation, eliminating the need for stepped annual adjustments.

The formulaic representation for this 'Mint Decrease' parameter can be outlined as:

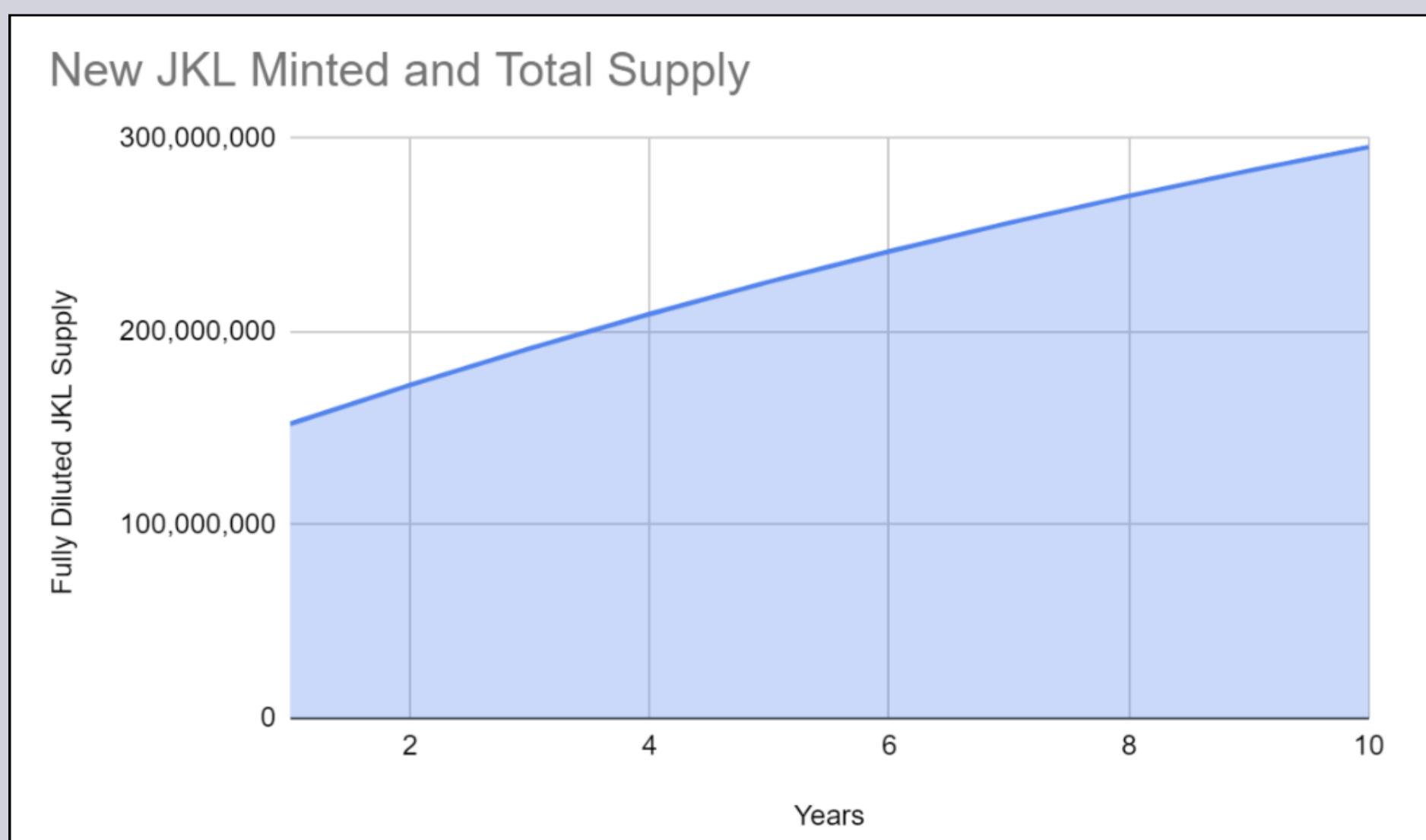
$$Mint_{n+1} = Mint_n - \frac{MintDecrease}{BlocksPerYear}$$

As an example:

$$\begin{aligned}Mint_{5,000,000} &= 4.2 \text{ JKL} \\MintDecrease &= 6\% \\BlocksPerYear &= 5,256,000 \\Mint_{5,000,001} &= 4.2 - \frac{0.06}{5,256,000} = 4.199999989\end{aligned}$$

Projecting the 'Mint Decrease' parameter at the proposed rate of 6% annually, the inflation and cumulative supply can be surmised:

| Year | New JKL Minted | Total Supply | Projected Inflation | Avg Tokens per Block |
|------|----------------|--------------|---------------------|----------------------|
| 1 | 21,412,944 | 152,335,496 | 16.36% | 4.07 |
| 2 | 20,128,167 | 172,463,663 | 13.21% | 3.83 |
| 3 | 18,920,477 | 191,384,141 | 10.97% | 3.60 |
| 4 | 17,785,249 | 209,169,389 | 9.29% | 3.38 |
| 5 | 16,718,134 | 225,887,523 | 7.99% | 3.18 |
| 6 | 15,715,046 | 241,602,569 | 6.96% | 2.99 |
| 7 | 14,772,143 | 256,374,712 | 6.11% | 2.81 |
| 8 | 13,885,814 | 270,260,526 | 5.42% | 2.64 |
| 9 | 13,052,666 | 283,313,192 | 4.83% | 2.48 |
| 10 | 12,269,506 | 295,582,697 | 4.33% | 2.33 |



The adoption of a per-block parameterization approach fosters autonomous operational efficiency. It removes the need for conjectures on block/year projections or annual voting for mint reductions. Instead, the gentle tapering of minting becomes fully automated. Now a malleable parameter, it allows for easy adjustments to meet the future economic demands of the protocol and community aspirations.

Inflation Distribution

To effectively decentralize expenses beyond just ensuring chain security, provisions for sustained expenses are essential. This includes allocating funds for storage providers, continuous development, community initiatives, and securing the network.

Several Cosmos blockchains have adopted inflation taxes to nurture organizations and bolster Community Pools. While these pools offer versatility for addressing unforeseen requirements, predefined perpetual needs ought to have dedicated allocations. The economic model being proposed suggests three distinct taxes, all of which are modifiable through JKL governance parameters.

Storage Stipend (12%)

A stipend for storage providers increases resiliency for the physical infrastructure network.

Initially pegged at 60% of inflation, this economic model proposes to re-calibrate to 12% of inflation in the immediate future. Governance retains the prerogative to make further adjustments as needed.

Storage expenses are critical since they preemptively address revenue potential for the protocol. If the stipend pool surpasses the stipends distributed to storage providers, a reserve will naturally accumulate. However, should these reserves deplete as the protocol scales, governance has the flexibility to elevate the stipend tax, increase inflation, or restructure the stipends.

Community Pool (10%)

Jackal's growth trajectory demands consistent investment. Funding is pivotal for furthering application development and ensuring seamless integrations. The community should have adequate resources to influence strategic direction. An augmented community tax is instrumental in charting a favourable course for the protocol.

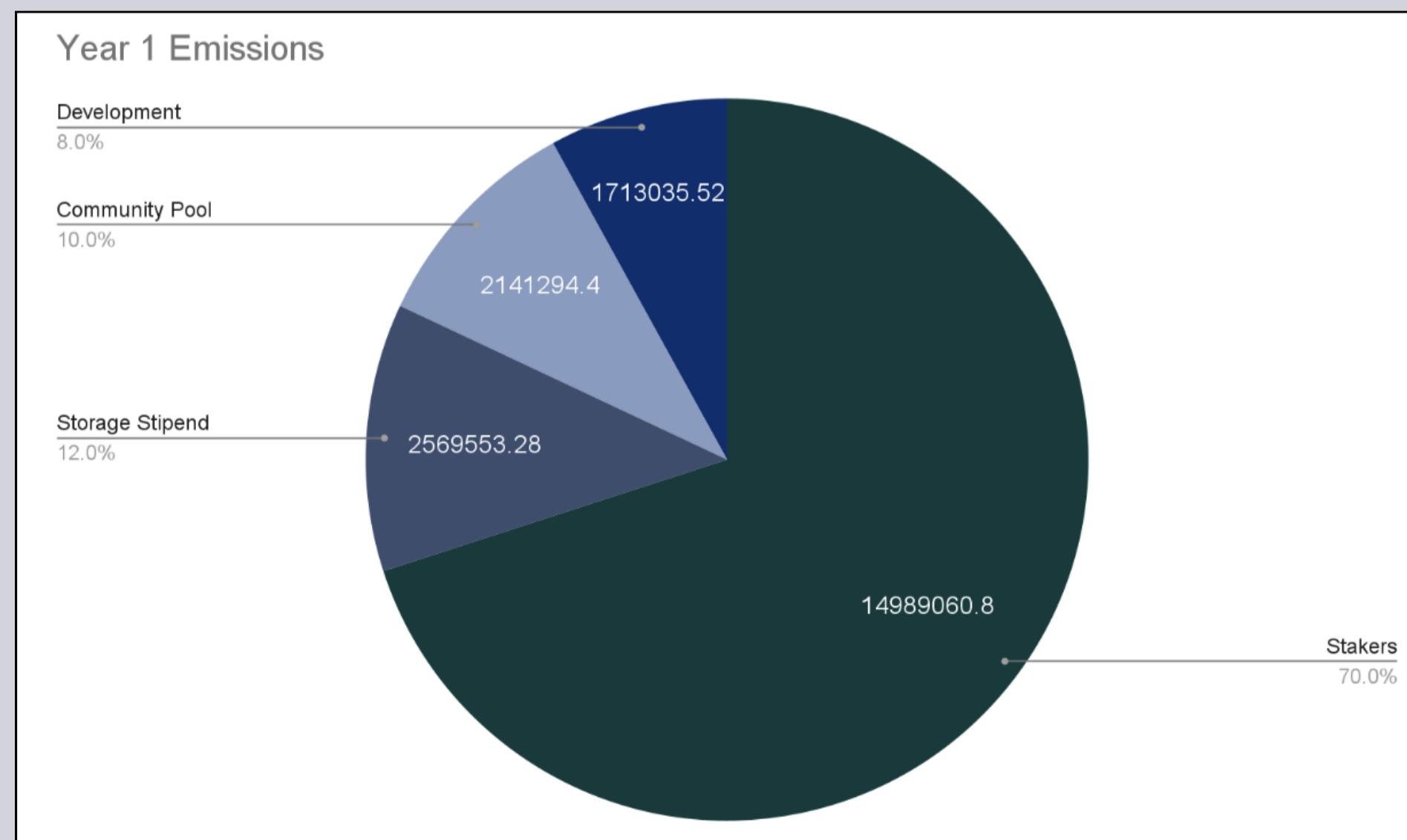
Given these tax allocations, the distribution of the first year's emissions would be segmented as follows:

Development Incentive (8%)

Protocol development teams will be compensated through JKL token emissions with governance oversight. This model ensures the efforts of current and future development teams are budgeted for in perpetuity, driving innovation and protocol growth.

Stakers (70%)

To bolster security of the protocol, staking rewards are needed to reward community members when securing the network and participating in governance.



REAL YIELD FRAMEWORK

This new economics model will introduce real yield, protocol owned liquidity and update the pricing structure for data storage space. Adjusting the pricing structure is imperative to ensure the Jackal Protocol's sustainability. The proposed pricing model aims to strike a balance, ensuring sufficient profit margins for the protocol. In addition to accepting payment for storage space in JKL, the protocol will also accept additional tokens such as USDC.

Unit Cost Adjustments

Monthly

| TBs | Price | Price/TB/Month |
|-------|----------|----------------|
| 0.002 | \$0.03 | \$15.00 |
| 1 | \$15.00 | \$15.00 |
| 5 | \$70.00 | \$14.00 |
| 20 | \$250.00 | \$12.50 |

Yearly

| TBs | Price | Price/TB/Month |
|-------|------------|----------------|
| 0.002 | \$0.025 | \$12.50 |
| 1 | \$150.00 | \$12.50 |
| 5 | \$700.00 | \$11.67 |
| 20 | \$2,500.00 | \$10.42 |

The new unit cost for storage accounts leaves wiggle room for a unit ratio below 100%. This buffer is crucial for accommodating decentralized referral commission structures, storage discounts, and generating protocol revenue.

Protocol governance oversees a fully parameterized system, ensuring revenue distributions that encourage sustainable growth while mitigating potential risks.

Yield Distribution

| Storage Term | User Discount | Referral Commission | Storage Providers | Protocol Owned Liquidity |
|--------------|---------------|---------------------|-------------------|--------------------------|
| Yearly | 5% | 25% | 35% | 35% |
| Monthly | 10% | 25% | 35% | 30% |
| No Referral | X | 25% | 35% | 40% |

As the Jackal Protocol expands offerings, introducing new options such as cold storage, each will have its own pricing structure. Nevertheless, the foundational principles for determining these rates should echo the considerations highlighted above.

Referral Commission & Discounts

In the decentralized landscape, traditional centralized sales teams should be upgraded to decentralized initiatives. With this ethos, the Jackal Protocol promotes a system where any community member can be rewarded for driving protocol growth. By increasing the unique data stored by the protocol, community members earn rewards while also securing storage discounts for referred users.

Specifically:

- 25% of the protocol's data storage revenue is allocated for commissions.
- Users who transact through a referral link benefit from discounts: 5% for annual payments and 10% for monthly payments.

The Retriever Name Service (RNS) blockchain module makes this possible. RNS is an IBC name resolver that converts Cosmos addresses into easily readable names. This module, built directly into the Jackal Protocol, allows any active domain to function as a referral code to earn commissions.

Although new users have an incentive to use referral codes and receive discounts, commissions will be collected from all sales. Any commission unclaimed due to the absence of a referral will be proportionally distributed among active stakers securing the network.

Example:

1. Consider Alice, who acquires the domain Alice.jkl.
2. He manages to facilitate sales equating to \$5,000 worth of storage.
3. The user chooses a yearly storage plan.

| Referral Source | User Discount | Protocol Revenue | Commission |
|-----------------|---------------|------------------|------------|
| Alice.jkl | 250 | \$3,500 | \$1,250 |

Protocol Owned Liquidity

The Jackal Protocol will begin accepting storage payments in additional tokens such as USDC, in addition to JKL. The management of protocol profits is pivotal to the intrinsic value of the JKL token. Traditional buybacks and burns, while effective, can result in pronounced volatility.

A more balanced approach is the cultivation of protocol-owned liquidity (POL). Envision a scenario where the entirety of protocol storage revenue is in USDC. Here, half of the protocol's share could be used to buy JKL tokens, with the entire amount being supplied as liquidity in a balanced manner. This strategy not only creates demand but also reduces short-term price fluctuations. By building POL, Jackal can minimize liquidity provision costs and unlock opportunities to diversify protocol revenue.

Assume in the future, the JKL token has sufficient liquidity and the Jackal Protocol possesses \$1M in POL, divided between \$500k USDC and JKL tokens equivalent to \$500k. Given this, Jackal community governance might contemplate:

- Burning surplus JKL tokens.
- Contributing JKL to the Community Pool while leveraging the 500k USDC as collateral in a lending protocol, thereby generating additional revenue streams for the Jackal Protocol.

POL for the Jackal Protocol unlocks new revenue streams and minimizes the cost of liquidity provision, strengthening the protocol while unlocking more liquidity and flexibility for community governance.

STORAGE PROVIDER INCENTIVES

With the overarching considerations outlined, it's crucial to establish a transparent and sustainable revenue model for storage providers. This is achieved with real yield from protocol revenue paired with a stipend, both introduced earlier in the document. This model offers a storage stipend below the protocol's lowest cost basis to ensure protocol profitability. In addition, to encourage desired redundancy and decentralization, stipends should be reduced progressively for larger quantities of storage provided, reflecting a diminishing returns approach.

Stipend Distribution (Per Terabyte, TB):

| TBs Provided | Stipend per TB |
|--------------|----------------|
| 0-100 | \$2.40 |
| 100-200 | \$1.80 |
| 200-300 | \$1.60 |
| 300-400 | \$1.50 |
| 400-500 | \$1.40 |
| 500-1,000 | \$1 |

Stipends will be disbursed by a governing DAO using funds accumulated from the *Storage Tax*. The higher stipend for the initial 100 TBs is strategically designed to attract a diverse range of storage providers, while bulk storage providers can leverage their scale to generate more revenue, acknowledging their significant operational contributions to the protocol.

To combat manipulation of the storage provider incentive structure, the stipend's JKL price will be determined by the highest value among the 7, 30, and 90-day moving averages.

Example:

Let's say Alice offers 250 TB of storage to the Jackal protocol. Her monthly stipend calculation would be:

$$100 \times \$2.40 + 100 \times \$1.80 + 50 \times \$1.60 = \$500$$

Considering the JKL moving averages at the time of writing, Alice's JKL stipend would be based on the 7 day moving average.

7D Moving Average: \$0.05575

30D Moving Average: \$0.05220

90D Moving Average: \$0.04113

$$\frac{\$500}{\$0.05575} = 8,968.08 \text{ JKL}$$

As mentioned previously, storage providers will also partake in 25% of the protocol's sales revenue. This share will be directly tied to the amount of data stored on a provider's machine. Payments will be in USDC, JKL, and other tokens accepted by the protocol, mirroring the method used by users to purchase storage.

In scenarios where stipends surpass the JKL obtained via *StorageTax*, providers might earn less than anticipated. Such situations can arise due to factors like JKL price drops, reduced inflation, modified tax rates, or expanding storage supply. Should this occur, stipends would be proportionally adjusted, prompting discussions on community forums. Potential mitigation strategies might include:

- Continuing with adjusted stipends indefinitely
- Revising the stipend rates
- Modifying inflation or the *StorageTax* parameter
- Increasing the revenue-sharing percentage for storage providers
- Sourcing funds from the Community Pool or Protocol Owned Liquidity.

CONCLUSION

This document sets forth a comprehensive plan of action. Still, every blockchain protocol, regardless of its structure, demands ongoing adaptation, scrutiny, and innovation. The Jackal community must stay vigilant, receptive to emerging knowledge, and agile in its strategy.

Periodic evaluations of foundational indicators such as cost structures, profit margins, and protocol spending patterns are imperative. For a decentralized model to scale with efficacy and efficiency, the diverse expertise and proactive engagement of community members are indispensable.

The Jackal Protocol continues to emerge as a catalyst for sustainable decentralized physical infrastructure networks. The economic blueprint outlined herein is both adaptive and robust, equipped to flourish during prosperous periods and maintain resilience in leaner times. However, the bedrock of enduring success is rooted in community collaboration and protocol growth.

Collectively, we optimize the Jackal Protocol to be an enduring and ever-evolving protocol.



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