DECEMBER 2023

Andromeda Tokenomics

Sustainable open source software is humanity's greatest defense against the encroachment of governments, business, malicious agents and AI on human rights.

Andromeda

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By accessing the Token Documentation or the Website (or any part thereof), you shall be deemed to represent and warrant to the Company, the Distributor, their respective affiliates, and the Andromeda Project Contributors as follows: (a) in any decision to acquire any ANDR, you have not relied and shall not rely on any statement set out in the Token Documentation or the Website; (b) you shall at your own expense ensure compliance with all laws, regulatory requirements and restrictions applicable to you (as the case may be); (c) you acknowledge, understand and agree that ANDR may have no value, there is no guarantee or representation of value or liquidity for ANDR, and ANDR is not an investment product nor is it intended for any speculative investment whatsoever; (d) none of the Company, the Distributor, their respective affiliates, and/or the Andromeda Project Contributors shall be responsible for or liable for the value of ANDR, the transferability and/or liquidity of ANDR and/or the availability of any market for ANDR through third parties or otherwise; and (e) you acknowledge, understand and agree that you are not eligible to participate in the distribution of ANDR if you are a citizen, national, resident (tax or otherwise), domiciliary and/or green card or permanent visa holder of a geographic area or country (i) where it is likely that the distribution of ANDR would be construed as the sale of a security (howsoever named), financial service or investment product and/or (ii) where participation in token distributions is prohibited by applicable law, decree, regulation, treaty, or administrative act (including without limitation the United States of America, Canada, and the People's Republic of China); and to this effect you agree to provide all such identity verification document when requested in order for the relevant checks to be carried out.

ANDR are designed to be utilised, and that is the goal of the ANDR distribution. In particular, it is highlighted that ANDR: (a) does not have any tangible or physical manifestation, and does not have any intrinsic value (nor does any person make any representation or give any commitment as to its value); (b) is non-refundable and cannot be exchanged for cash (or its equivalent value in any other digital asset) or any payment obligation by the Company, the Distributor or any of their respective affiliates; (c) does not represent or confer on the token holder any right of any form with respect to the Company, the Distributor (or any of their respective affiliates), or their revenues or assets, including without limitation any right to receive future dividends, revenue, shares, ownership right or stake, share or security, any voting, distribution, redemption, liquidation, proprietary (including all forms of intellectual property or licence rights), right to receive accounts, financial statements or other financial data, the right to requisition or participate in shareholder meetings, the right to nominate a director, or other financial or legal rights or equivalent rights, or intellectual property rights or any other form of participation in or relating to Andromeda, the Company, the Distributor and/or their service providers; (d) is not intended to represent any rights under a contract for differences or under any other contract the purpose or intended purpose of which is to secure a profit or avoid a loss; (e) is not intended to be a representation of money (including electronic money), payment instrument, security, commodity, bond, debt instrument, unit in a collective investment or managed investment scheme or any other kind of financial instrument or investment; (f) is not a loan to the Company, the Distributor or any of their respective affiliates, is not intended to represent a debt owed by the Company, the Distributor or any of their respective affiliates, and there is no expectation of profit nor interest payment; and (g) does not provide the token holder with any ownership or other interest in the Company, the Distributor or any of their respective affiliates. Notwithstanding the ANDR distribution, users have no economic or legal right over or beneficial interest in the assets of the Company, the Distributor, or any of their affiliates after the token distribution. For the avoidance of doubt, neither the Company nor the Distributor deals in, or is in the business of buying or selling any virtual asset or digital payment token (including ANDR). Any sale or distribution of tokens would be performed during a restricted initial period solely for the purpose of obtaining project development funds, raising market/brand awareness, as well as community building and social engagement; this is not conducted with any element of repetitiveness or regularity which would constitute a business. To the extent a secondary market or exchange for trading ANDR does develop, it would be run and operated wholly independently of the Company, the Distributor, the distribution of ANDR and Andromeda. Neither the Company nor the Distributor will create such secondary markets nor will either entity act as an exchange for ANDR.

No regulatory authority has examined or approved, whether formally or informally, any of the information set out in the Token Documentation or the Website. No such action or assurance has been or will be taken under the laws, regulatory requirements or rules of any jurisdiction. The publication, distribution or dissemination of the Token Documentation or the Website does not imply that the applicable laws, regulatory requirements or rules have been complied with.

Summary

1. **Andromeda powers business model creation and deployment that is aligned with the accelerating rate of global change. Build and test new Web3 business models at global scale in minutes at no cost.**

2. **Andromeda Operating System (aOS) is a multi-chain, cross-chain operating system built on a breakthrough in modular and composable smart contract architecture. It powers decentralized applications, aggregates capabilities across chains, and creates network effects.**

3. **aOS, and the blockchains that use it, harness scaled network effects. New tokenomic models index value across each blockchains utilizing a multi-cryptocurrency design.**

4. **aOS and all participating chains increase their Total Available Market (TAM) with aOS network effects. All get increased demand on their token.**

5. **Utility Value scales as a function of Metcalfe's Law $V=n^2$ where 'n' is the number of users on all the blockchains using aOS.**

6. **A vast application design space unlocks powerful incentives to produce compelling Web3 revenue.**

7. **aOS creates a viable new economic model for monetizing open source software development leading to explosive growth across Web3.**

> "A key feature of crypto - an open source decentralized computing platform - is that projects can act as a multiplier when their composable components are reused, recycled, and adapted by others. Composability is to software as compounding interest is to finance: an exponential force."
>
> – Chris Dixon, Managing Partner at a16z

Introduction

In today's legacy business it takes months or years to deliver a new innovation to the market.

The process is slowed by intermediaries and costs, with an ever present risk of getting there too late. aOS removes technological barriers to:

1. **Aligning the speed of business model creation and deployment with the accelerating rate of global change;**
2. **Build and Test business models at Global Scale in minutes at no cost;**
3. **De-risking business / fraud reduction;**
4. **Instant access to infrastructure rails - permissionless access to compute, storage, payment, marketplace, distribution, application, and other service infrastructure;**
5. **Tokenization and Digital Ownership of assets;**
6. **Global market access;**
7. **Instant community access;**
8. **Eliminate intermediaries; and**
9. **Variable costs of operation**

aOS is a Web3 operating system for using and building applications on decentralized blockchain infrastructure. It is an entirely new layer of software that manages the complexity of interacting with many blockchains. It is installed as a library of smart contracts and operates on a blockchain - a breakthrough in modular and composable smart contract architecture. When installed on multiple blockchains it enables multi-chain and cross-chain application development. These applications can operate on a single chain and across multiple chains with the aOS developer tools. These applications can aggregate, integrate, and distribute capabilities across multiple chains and ecosystems.

This new disruptive technology, and unique user interface, quickly solves user, builder, and creator's application development problems. Projects and businesses can go from ideation to development to delivery in a compressed time at a fraction of the cost - previously unimaginable in Web1, Web2, or Web3. Demand for this capability, proven in two years of market study and feedback, promises that the use of this powerful new aOS will unleash powerful network effects for each integrated chain across the Cosmos Ecosystem.

This white paper describes the Andromeda token supply, allocation, emission, and release schedule. It introduces token-related concepts unique to Andromeda such as domain of operation, network effects, and utility value abstraction layers. The sections on token categories describes the different utility value mechanics, total value locked, wealth preservation, governance and modular tokenomics. Finally, a new open source software economic model is described that enables explosive growth.

Token Supply

ANDR is the utility token used by the Andromeda Blockchain and aOS.

The ANDR token supply is fixed at 1 Billion tokens. Unlike most Proof of Stake chains, Andromeda is not inflationary. This is achieved by pre-minting a batch of tokens for validator rewards at genesis. This reserve of tokens is drawn down over time and replaced by network fees throughout the aOS install base. At first, the drawdown will outpace replenishment, but over time ecosystem mechanics will become sustainable. The DAO allocates a 6 year supply of validator rewards to ensure enough time for the system to become minimally sustainable.

Token Allocation

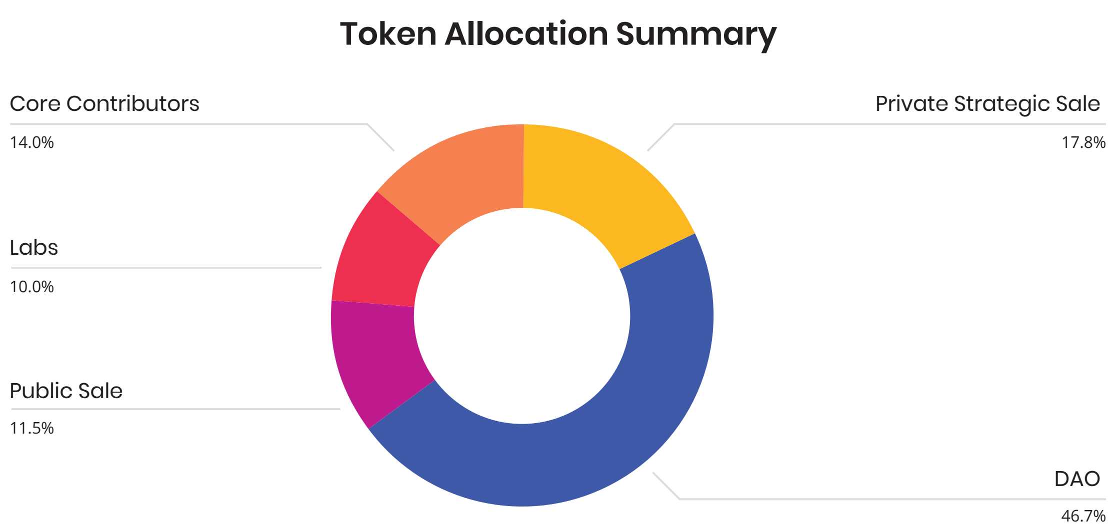
The ANDR token supply is allocated as seen in the Token Allocation Summary chart below.

These token allocations have been made with the guidance of project contributors, market makers, community members, and many different online resources. The source data for this allocation is found in Appendix 4 - Token Allocation Table. A more detailed Token Allocation chart is found in Appendix 3 - Token Allocation Detail.

Best practices for token allocation vary widely with respect to Founders/Core Contributors. Research reveals ranges from ~1% to 52%. Because of the unique scaling characteristics, Andromeda has chosen the lower end of the range in order to optimize the other allocation percentages.

The Labs allocation is for supporting an operating company thats performs ongoing development, maintenance and operation of the protocol software. This includes
The Public Sale allocation includes 5.5% for public sale and 6% for multiple market makers.
The Private Strategic Sale allocations include 8.13% for Pre-Seed purchasers and 9.09% for Seed/SAFT purchasers.

The DAO is allocated 46.67% of total tokens. These includes 5% earmarked for protocols and chains, 2.5% for validators, 10% for validator incentives, 26% for Treasury and 3% for Advisors.

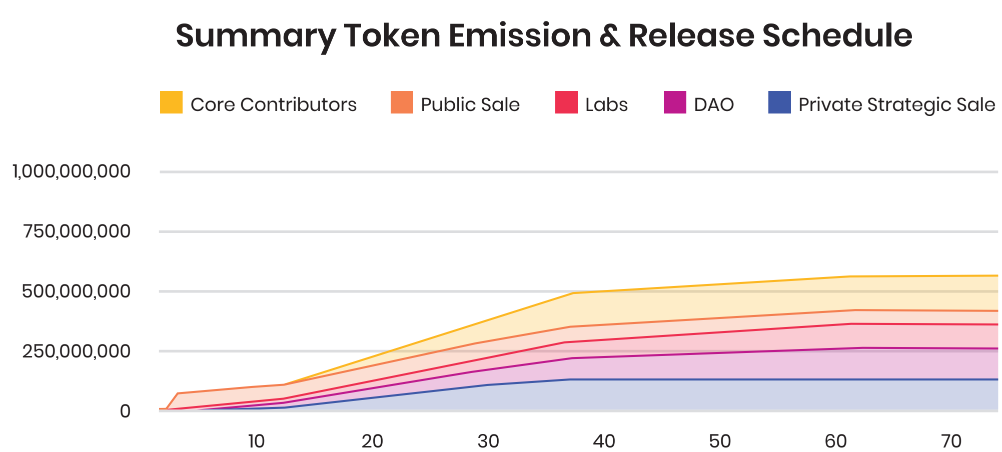


Andromeda

Token Emissions & Release Schedule

The token emissions and release schedule below shows a carefully engineered token emission profile.

The gradual introduction of circulating supply occurs over 6 years (72 months) and culminates in just over 50% of total supply in circulation. Lockup and Vesting Details can be found in Appendix 4 - Token Allocation Table.



Token Utility & Usage

The ANDR token has the largest tokenomic design space known because of the unique capabilities and architecture of aOS.

This empowers the DAO to test, measure and adjust for different scenarios and possibilities. The intention is to achieve a deliberate and stable user growth. The aOS tokenomics supports calibrated utility value and tradeoffs between ANDR supply and demand.

The token utility enables it to power decentralized applications on aOS. In the section below, Andromeda Tokenomics Concepts, many different utility mechanisms are described. These, and many variations thereof, use ANDR, tokens, cryptocurrencies and stable tokens to create utility value.

ANDR is used to secure the Andromeda Blockchain. This is accomplished by staking ANDR with validators, who help to maintain the Andromeda Blockchain and are rewarded with ANDR for their efforts.

Andromeda Tokenomic Concepts

The native cryptographically-secure fungible protocol token of Andromeda (ticker symbol ANDR) is a transferable representation of attributed governance and utility functions specified in the protocol/code of Andromeda, and which is designed to be used solely as an interoperable utility token thereon.

ANDR is a functional multi-utility token which will be used as the medium of exchange between participants on Andromeda in a decentralised manner. The goal of introducing ANDR is to provide a convenient and secure mode of payment and settlement between participants who interact within the ecosystem on Andromeda without any intermediaries such as centralised third party entity/institution/credit. It is not, and not intended to be, a medium of exchange accepted by the public (or a section of the public) as payment for goods or services or for the discharge of a debt; nor is it designed or intended to be used by any person as payment for any goods or services whatsoever that are not exclusively provided by the issuer. ANDR does not in any way represent any shareholding, ownership, participation, right, title, or interest in the Company, the Distributor, their respective affiliates, or any other company, enterprise or undertaking, nor will ANDR entitle token holders to any promise of fees, dividends, revenue, profits or investment returns, and are not intended to constitute securities in the British Virgin Islands, Singapore or any relevant jurisdiction. ANDR may only be utilised on Andromeda, and ownership of the same carries no rights, express or implied, other than the right to use ANDR as a means to enable usage of and interaction within Andromeda. The secondary market pricing of ANDR is not dependent on the effort of the Andromeda Project Contributors, and there is no token functionality or scheme designed to control or manipulate such secondary pricing.

For the avoidance of doubt, neither the Company nor the Distributor deals in, or is in the business of buying or selling any virtual asset or digital payment token (including ANDR). Any sale or distribution of tokens would be performed during a restricted initial period solely for the purpose of obtaining project development funds, raising market/brand awareness, as well as community building and social engagement; this is not conducted with any element of repetitiveness or regularity which would constitute a business.

Further, ANDR provides the economic incentives which will be distributed to encourage users to exert efforts towards contribution and participation in the ecosystem on Andromeda, thereby creating a mutually beneficial system where every participant is fairly compensated for its efforts. ANDR is an integral and indispensable part of Andromeda, because without ANDR, there would be no incentive for users to expend resources to participate in activities or provide services for the benefit of the entire ecosystem on Andromeda. Given that additional ANDR will be awarded to a user based only on its actual usage, activity and efforts made on Andromeda and/or proportionate to the frequency and volume of transactions, users of Andromeda and/or holders of ANDR which did not actively participate will not receive any ANDR incentives.

Andromeda Tokenomic Concepts

Domains

ANDR is a token originated on the Andromeda Blockchain. The token is used in two domains 1) it secures the Andromeda Blockchain; and 2) it powers the aOS. The demand for ANDR scales exponentially across many blockchains and ecosystems because of the aOS. **Most of the anticipated utility value of ANDR is a function of the wide deployment and usage of the aOS on many different blockchains.** The Andromeda Blockchain is not essential to the deployment and use of the aOS across blockchains. However, it is vital to the ongoing innovation, automation, and other unique capabilities the Andromeda Blockchain is bringing to market.

Network Effects

Andromeda's capability to create ecosystem wide network effects are the result of the deployed aOS topology. It is fundamental to understanding the scope and nature of Andromeda's tokenomic models. A typical blockchain captures value based on the unit economics per user. Andromeda's operating system creates value and provides more abundant opportunities to expand and extend value than any single project or blockchain. This is possible because it radically expands the application design space with functionality across many chains. aOS utility value increases exponentially by accessing users across many blockchains.

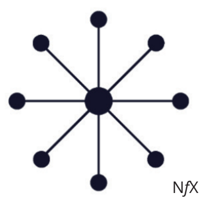
Sarnoff's Law describes a single project's Utility Value potential as it scales in proportion with the number of users. Metcalfe's Law or Reed's Law, in the diagram below, describes the potential Utility Value driven by network scaling properties of aOS in the multi-chain and multi-ecosystem future.

> **"Over the past 23 years, network effects have accounted for approximately 70% of the value creation in tech."**
> **– James Currier[1]**

[1]Network Effects https://www.nfx.com/post/70-percent-value-network-effects

Sarnoff’s Law describes a single project’s utility value potential as it scales in proportion with the number of users. Metcalfe’s Law or Reed’s Law, in the diagram below, describes the potential utility value driven by network scaling properties of aOS in the multi-chain and multi-ecosystem future.

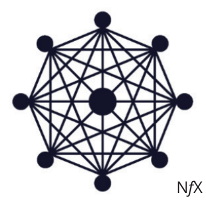
Sarnoff’s Law



$V=n$

The value of the network (V) increases in direct proportion to the size of the network (n).

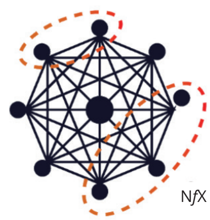
Metcalfe’s Law



$V=n^2$

The value of the network increases to the square of the number of users in the network.

Reed’s Law



$V=2^n$

Source; NFX*Bible

Networks may grow proportionally to the network size but there are forming groups that scale faster in value than others (because of influence or interconnectedness).

ANDR Value scales as a function of Metcalfe’s Law **$V=n^2$** or Reed’s Law **$V=2^n$** where ‘n’ is the number of users on all the blockchains using aOS. After years of study, from multiple recognized experts (entrepreneurs with unicorn exits), NFX has become the business standard for Network Effects thinking, investing, and incubation. NFX teaches that once critical mass is achieved (enough users) the value of the network exceeds the value of the product. Metcalfe defined it as Value = n^2.

The multi-chain topology of aOS means tokenomics can be powered using multiple cryptocurrencies across many blockchains. The effect is that ANDR indexes value across ecosystems with a diversified portfolio of cryptocurrencies. As a simple example, consider a single multi-chain application operating on blockchains A and B. When the Andromeda Network Fees are collected on each chain they can be paid in either ANDR or the chain-native token. So this simple application can capture value with ANDR, Token A or Token B.

Tokenomic Categories

The Andromeda aOS and blockchain are engineered to support many different tokenomic models concurrently. This confers significant benefits to ANDR. Andromeda has retained expert advice to analyze and model these different options.

Andromeda’s different tokenomic models are organized into five **categories**:

1. **Utility Value**
2. **Total Value Locked (TVL)**
3. **Wealth Preservation**
4. **Governance**
5. **Modular Tokenomics**

ANDR is used in both domains: aOS and the Andromeda Blockchain. Both domains benefit from multiple tokenomic model categories. They confer maximum flexibility and improve resilience. For example, aOS operates on many different blockchains and therefore if any single chain fails the impact to the overall value of ANDR is limited to that single chain. Thus mitigating the risks of any single-chain failure to ANDR. Similarly, because ANDR is deployed across many tokenomic models it is less susceptible to the failure of any single tokenomic model. The Tokenomic Categories are explained further below, but first it is important to understand abstraction layers.

Utility Value Abstraction Layers

Utility Value Abstraction Layers conceptualize and define where value is captured in each domain. aOS is engineered to support Tokenomic Models that can capture, meter, aggregate, and store value at different layers. This is a powerful innovation that unlocks new commercial possibilities for ‘Making Web3 Open Source Software Investable and Sustainable’ - discussed in that section below. It also helps Web3 solutions align with the customary payment arrangements used by enterprises such as subscription models, application bundlings, and other desirable variable usage schemes. Importantly, it enables communities, consortia, trade groups and collectivities to participate in Collaborative Finance (CoFi) arrangements for automatic debt obligation clearing and other high-yield and highly-efficient capital allocation strategies.

Utility Value Abstraction Layers		
Layer Number	**Tokenomic Domains**	
6	Community	
5	Vendor	
4	Bundled Apps	Miner Extracted Value - Ops
3	Application	Miner Extracted Value - Automation
2	ADO (smart contract)	Staking Ops
1	Module (smart contract component)	Staked Security & Governance
0	aOS	Andromeda Blockchain

Tokenomic Categories Explained

Utility Value

Utility Value tokenomic models define the ANDR utility by which economic benefits accrue to ANDR. Many of the models contemplated are technically independent (they are not engineered to interact). In this way, Utility Value across much of Andromeda's design space can be achieved. This promotes correct engineering resource allocation and expands the possible economic incentive designs to steer the project as an infinite game.[2] Simply stated, the aOS is not reliant on a single tokenomic model. Instead, it has multiple paths to capture value, incentivize value-creation, and reward actively participating token holders. The token models presented here are not exhaustive.

aOS Utility Value tokenomics are organized thus:

1. **Andromeda Network Fees**
2. **Andromeda Store Fees**

Andromeda Network Fees

Andromeda Network Fees are described by the specific objectives that are managed by the Andromeda DAO. This creates more transparency for community and stakeholder assessment of the ongoing network operations, network tactical and strategic planning. It enables better alignment to meet the needs of the different constituents.

1. **Platform Maintenance**
2. **Developer Recovery Fees**
3. **Software Developer Incentives**
4. **Carried Value Fee**
5. **Per ADO Instantiation**

These fees can be collected, aggregated, and stored at different abstraction layers. Additionally Andromeda Network Fee rates can be calibrated using bonding curves based on different Abstraction Layers.

[2] infinite games (e.g. business and politics) are played for the purpose of continuing play rather than to win. https://en.wikipedia.org/wiki/The_Infinite_Game

Andromeda Network Fees	aOS Abstraction Layers					
	Consortia	Vendor	Bundled Apps	Application	ADO (smart contract)	Module (smart contract component)
Platform Maintenance	X	X	X	X	X	X
Developer Recovery Fees	X	X	X	X	X	X
Software Developer Incentives	X	X	X	X	X	X
Carried Value Fee	X	X	X	X	X	X
Per ADO Instantiation	X	X	X	X	X	X

Some Andromeda transaction fees will use bonding curves that saturate over time to cap fees as a function of transaction quantity or value.

1. ***Platform Maintenance Fees* are collected to cover the cost of operations.**

2. ***Developer Recovery Fees* are collected to pay software developers who have provided software in exchange for an economic interest in the software they have provided.**

3. ***Software Developer Incentives* are a category of contingent and performance-driven fee.**

4. ***Carried Value Fees* are collected as a function of the underlying economic value**

5. ***Per ADO Instantiation* is a fee collected at the time of committing the contract(s) to the blockchain.**

The intersection of Andromeda Network Fees and aOS Abstraction Layers are a powerful combination that offers fine-grained control to optimize for economic cost and performance.

Network fees can be paid in ANDR, chain-native tokens or stable coins. Payment in chain-native tokens means aOS captures value and creates demand for a blockchain's token. aOS' distribution across many blockchains results in pools of chain-native tokens that index value across blockchain ecosystems. **It means value is captured as a diversified portfolio of cryptocurrencies that scales as the blockchains and ecosystems scale.** A diversified portfolio of crypto currencies has beneficial risk characteristics that mitigates single currency risks. It also produces an implicit option to calibrate ANDR supply and demand open market operations. These possibilities make ANDR extremely unique and useful.

Andromeda Store Fees

aOS has an application store that has ready-made apps, tools, utilities for users, developers and creators. There are many different ways to monetize the store offerings. The desired effect is to create a conduit by which open source developers can be compensated for their development, protect project contributors in software development, and create powerful incentives for explosive growth in application development and overall software available. It is essential to avoid long-term consumer capture and lock-in to avoid the worst abuses of existing application stores like Apple.

1. **Per App Store Listing**
2. **Per App Store Sale**
3. **Usage of App Builder**
4. **Automation Activation**

Total Value Locked

Total Value Locked describes the category of token usage where the effect is that ANDR tokens are removed from circulating supply.

1. **Staking For Access**
2. **Resource Provisioning**

Staking For Access

Staking for access means ANDR or a chain-native token is required to access an Andromeda resource.

Staking for Access encompasses a wide range of token usage in order to unlock and access certain resources. An operating system has a multitude of services. These services are subject to abuse if they are provided for free - abuses like denial of service, spam, griefing, and other kinds of attacks directed at public infrastructure. Staking for Access is an important model for mitigating these sorts of problems.

Staking for Access also creates an important and measurable economic signal for the value a particular community, use-case, or technical domain is providing to the Andromeda network. This signal can be used to properly allocate resources and steer further development and attention for the betterment of the network.

Example Staking for Access:

1. **Automation Execution**
2. **Automation for Queue Priority**
3. **KYC/KYB/AML service - Third Party**
4. **Names Spaces**
5. **External Subscription Services**
6. **Others**

Resource Provisioning

Resource Provisioning means using ANDR tokens in order to pay for services. The terms ‘charge account’ or ‘pre-paid account’ could be substituted for Resource Provisioning. The idea is that applications using the aOS developer tooling can quickly and easily plug into services of many different kinds. Some of these services will be used on a recurring basis and it is easiest to pre-pay an account so that applications can operate automatically or without additional payment steps.

Example Resource Provisioning paying for:

1. **Storage (e.g. Arweave, Filecoin)**
2. **Computation**
3. **Beacons**
4. **Oracles**
5. **Third party services**
6. **Others**

Wealth Preservation

Wealth Preservation models are how Treasury-owned ANDR and chain-native tokens (cryptocurrencies) are deployed to effect the objectives of the Andromeda DAO. These objectives could include ANDR treasury management, increasing treasury yield, risk management, and other activities associated with diversified portfolio theory, investment management, and index fund management. This includes actions to insulate or otherwise buffer the token from volatility.

The Wealth Preservation models could be used to increase ANDR price. Multi-currency Utility Value by aOS across many blockchains enables many different strategies to satisfy the requirements of ANDR holders and protocol constituents. Active wealth preservation methods include:

1. **Protocol-owned Liquidity - traditional Liquidity Pool and re-basing models under review**
2. **Staking in other projects - various approaches**
3. **Active allocation of treasury assets**
4. **Asset Pools**
5. **Buy Indices to mitigate risk**

Governance

ANDR would allow holders to propose and vote on governance proposals to determine future features, upgrades and/or parameters of Andromeda, or provide feedback, with voting weight calculated in proportion to the tokens staked. The right to vote is restricted solely to voting on features of Andromeda; it does not entitle ANDR holders to vote on the operation and management of the Company, its affiliates, or their assets or the disposition of such assets to token holders, or select the board of directors or similar bodies of these entities, or determine the development direction of these entities, nor does ANDR constitute any equity interest in any of these entities or any collective investment scheme; the arrangement is not intended to be any form of joint venture or partnership. After governance launch there will be no individual or corporate entity or other active promoter, sponsor, or group or affiliated party that maintains sole control over Andromeda.

Andromeda will use typical governance models as seen throughout the Cosmos Ecosystem for the Andromeda Blockchain. The aOS governance model will initially be placed with the primary Andromeda DAO.

Governance models define how the Andromeda DAO is operated by the community. Andromeda DAO is committed to decentralized governance. There is a long list of governance processes. The intention is to construct governance processes that enable flexibility and responsiveness while simultaneously providing the community effective input and supervision to secure the protocol's independence.

Typical Andromeda Blockchain Proposals

Chain Upgrades, Tokenomics, Validator Rewards, Funding, Membership, Governance, Partnerships, Community, Technical, Treasury

There are ongoing investigations of time-based staking models that are similar to the vote escrow models developed in other projects. The idea is to stake ANDR which generates a time-based emission of vANDR. The emission is controlled by a bonding curve. vANDR is non-transferable and destroyed upon unstaking. This, or similar model, may provide some protection against the worst abuses of governance by whales and other transient strategies without deep alignment and investment with the protocol.

Modular Tokenomics

The aOS allows engineers to use its breakthrough modular smart contract architecture to create modular off-the-shelf tokenomic models using ADOs. This includes Token Generating Events (TGE) management, token allocations, vesting, cliffs, air-drops, and more. Other ADOs will be created for Utility Value in support of a project's utility token and overall tokenomics. The intention is that ANY project can deploy a vetted, audited tokenomic program using the library of aOS modular tokenomic models. These models will have been tested, modeled, and simulated by third parties using Agent-Based Modeling and other capabilities.

A New Web3 Open Source Software Business Model

The future of Web3 Open Source Software (OSS) has an economics problem that prevents it from being commercially investable (non-venture investment) and sustainable.

The future of Web3 Open Source Software (OSS) has an economics problem that prevents it from being commercially investable (non-venture investment) and sustainable. Web3, and specifically aOS, can solve this problem for Web3 projects with a new open source business model.[3]

OSS has delivered some of the most important contributions in the history of information technology. The global IT infrastructure 'rests' upon these successes. In one sense civilization 'rests' upon a foundation of open source software - 90% of all software contains some open source software. In another sense, civilization 'rests' on open source software because it's frequently asleep and can't be bothered to pay for it. Governments, enterprises, and individuals all over the world depend upon software developers who work for free. This arrangement is increasingly problematic as load-bearing OSS developers either age out, lose interest, launch their own projects, or join the next venture funded project.

Despite notable successes, the economic model for Web3 OSS has, historically, been unsustainable outside of DeFi transaction fees. This jeopardizes the larger design space and limits its contribution to the civilization that depends upon it. Although the number of OSS contributors has grown exponentially, the economic reality in Web3 demonstrates it is not commercially investable because most investments are contributed by venture capitalists. The observable effects are to attract open source software developers chasing venture returns in pursuit of breakthrough technology. Meanwhile, business adoption and investment has been non-existent or anemic. The Web3 tools and the OSS economic model have been insufficient to motivate businesses to build Web3 solutions for specific business purposes.

aOS presents breakthrough application development tooling and unmatched tokenomic model flexibility to meet future global demand for Web3 open source development. Developers build software and get paid every time the software is used. This represents a critical inflection point in the trajectory of Web3. The near term capabilities and possibilities of the technology, deployed at scale, are no longer an impediment to mass adoption. **The unharnessed value of open source software in Web3 business will be found in those leaders that can inspire a team commitment to a cause greater than the software itself while generating a reasonable commercial business case.**

[3] Business Models for Open Source Software https://en.wikipedia.org/wiki/Business_models_for_open-source_software

Tokenomics Conclusion

ANDR, aOS, and the Andromeda Blockchain introduce entirely new tokenomic models and network effects for unprecedented Utility Value for industry.

This Utility Value is denominated in the ANDR token and many different cryptocurrencies. The effect is to index the Utility Value across all of the ecosystems where aOS is deployed. Furthermore, the Utility Value scales exponentially with Network Effects as a function of the number of blockchains where the aOS is deployed. The aOS unlocks a vast application design space to drive rapid user growth. ANDR's value represents a diversified portfolio of blockchains' Utility Value.

There are many benefits from multiple tokenomic models. Unlike most blockchains and crypto projects worldwide, Andromeda's multi-tokenomic model eliminates the risk of any single tokenomic model failure. The aOS is more resilient and ANDR carries lower risks from those sorts of single model failures.

Users and enterprises can choose to operate aOS on chains that meet their needs and thereby enjoy user-selectable risks. aOS topology and multi-cryptocurrency support creates demand for other L1 tokens. It also creates a sustainable and investable open source software development model for Web3.

The different tokenomic models presented here will not be implemented concurrently. They will be implemented in phases. Some models, or modifications, may or may not be implemented at all based on ANDR stakeholder requirements and ongoing analysis and tokenomic design.

Appendix 1 - Network Effects

Network Effects are an economic phenomenon by which the value or utility a user derives from a good or service depends on the number of users of compatible products.[4] Consider the value of a telephone network with one telephone. It is not valuable until there is one more connection, or node. Each additional connection creates more value for everyone participating in the network. This is an example of a 'Physical Network Effect'. Facebook is an example of a 'Personal Network Effect.' There are other kinds of network effects.

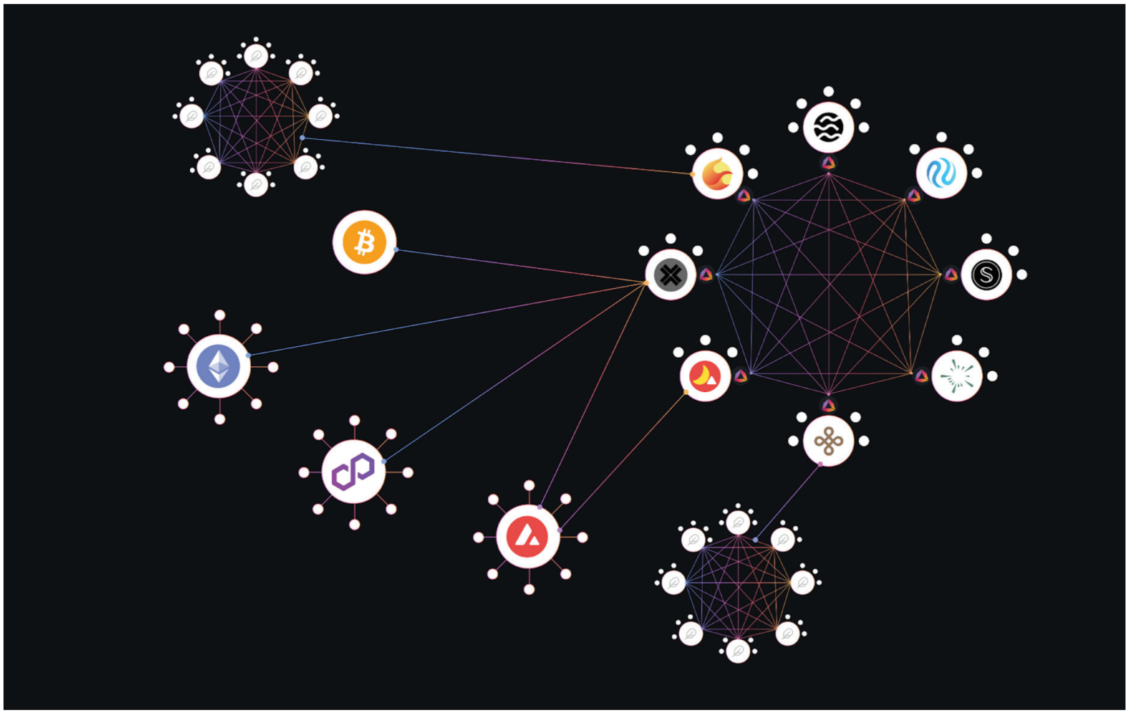
For example, Web3 is in the process of creating global decentralized infrastructure with specially engineered blockchains that provide unique capabilities, projects, and communities. aOS is installed on this blockchain infrastructure to fully realize, through Network Effects, the Utility Value of those capabilities, projects and communities. This includes Personal Network Effects, Market Network Effects, Protocol Network Effects, and others. These network effects create demand for all Web3 infrastructure rails across many industries and communities.

Andromeda is powered by the ANDR token. The tokenomic models described below are designed for their utility to power the Andromeda Operating System (the aOS), the Andromeda Blockchain, and those blockchains where aOS is installed. The multi-chain distribution of aOS results in historically unique tokenomic models that capture and index value across blockchains and their ecosystems.

History is being repeated. All early mainframe computers had individually developed programs and applications for each computer. The same thing occurred for PCs and Smartphones. Adoption skyrocketed once an operating system was built that could be shared by everyone to build new applications and create a common user experience. Operating systems have repeatedly unlocked powerful and valuable scaling laws for usage of the hardware, operating system, applications, and users. The multi-chain future requires a Web3 operating system for the same reasons.

aOS' unique network effects produce important new capabilities for decentralized blockchain infrastructure. It enables users, developers, and creators to use, access, integrate, and aggregate the capabilities of multiple blockchain ecosystems. Similarly, they can access all of the users across those ecosystems. The multi-chain distribution, on-chain architecture, and scaling laws[5] introduce a new way to sustainably incentivize and monetize open source software to support explosive growth.

[4] https://en.wikipedia.org/wiki/Network_effect
[5] Metcalfe's law states that the value of a telecommunications network is proportional to the square of the number of connected users of the system (n2). https://en.wikipedia.org/wiki/Metcalfe%27s_law



Appendix 2 - Resources

Andromeda's tokenomic models are being modeled and evaluated for their utility, suitability to purpose, sustainability, and resiliency. Implementation mechanics, ongoing management, and development of modular tokenomics are ongoing. Here is some of the expertise being applied to Andromeda's tokenomics:

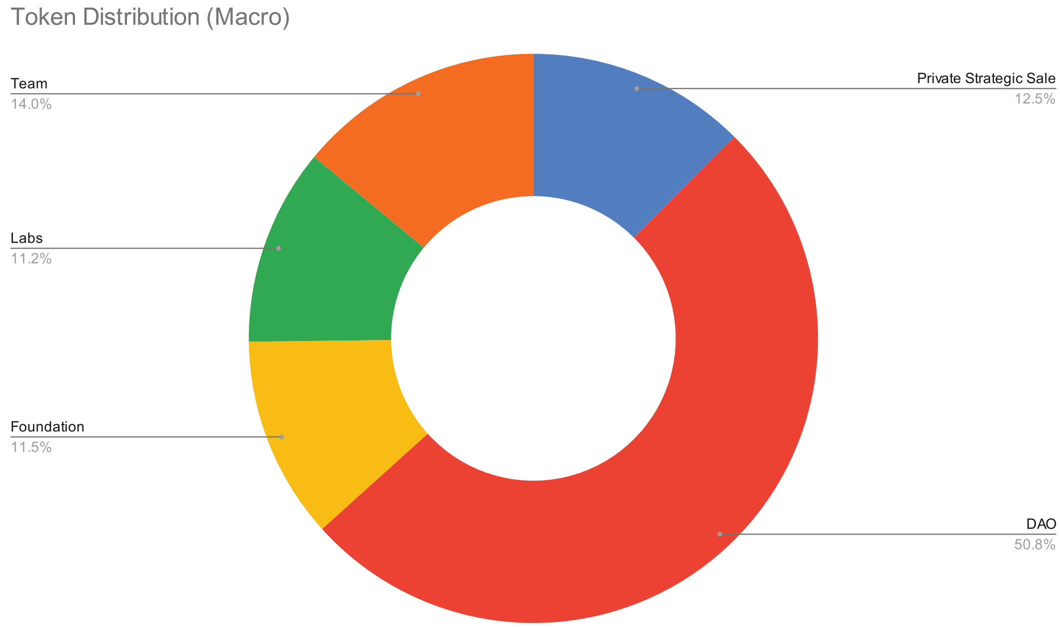
Data scientist and tokenomics expert with more than 10 years of experience. He has worked with decision makers from companies of all sizes: from startups to organizations like, the US Navy, Vodafone and British Land. He was also one of the first researchers in the area of blockchain to study and discuss tokenomics. His seminal work in token economics has led to many successful token economic designs using tools such as agent based modeling and game theory.

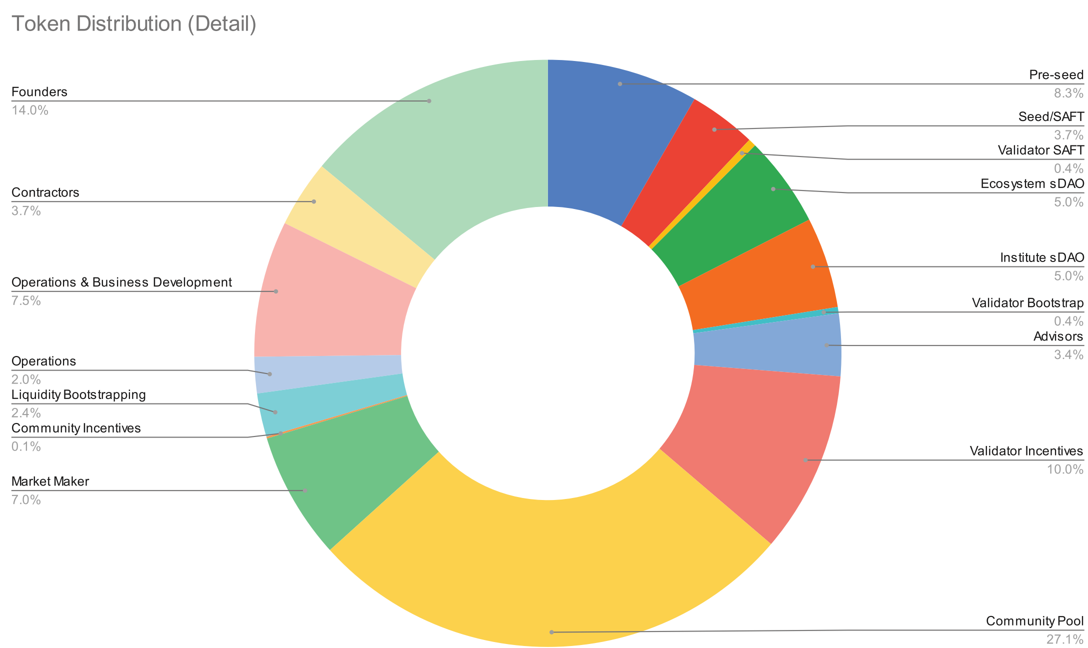
Researcher and lecturer in Database Design and Security and Blockchain Technologies. He holds an MA(Cantab) in Genetics from the University of Cambridge, UK and a double BSc in Computer Science and Mathematics from the University of Arizona, US. He completed his PhD on Database Forensics and Information Accountability at the University of Arizona. He has also worked as a postdoctoral research associate in the Computer Science department of the University of Illinois at Urbana-Champaign, US. Associate at the UCL Centre for Blockchain Technologies (UCL CBT) in London, UK and has served as a technical program committee member for the IEEE International Conference on Blockchain and Cryptocurrency (ICBC)

Specialist in cryptography, algorithmic design and Blockchain. He holds a BA/MA in Mathematics and a MSc in Pure Mathematics from the University of Cambridge, a MRes in Security Science and a PhD in Information Security with specialization in Cryptography from University College London. He was the first recipient in the UK Cyber Cipher Security Challenge in 2013. Industry Associate at UCL Centre for Blockchain Technologies, Expert in Residence at the Institute of Innovation and Entrepreneurship at the London Business School and Mentor in Blockchain at Judge Business School of University of Cambridge.

[4] https://en.wikipedia.org/wiki/Network_effect
[5] Metcalfe's law states that the value of a telecommunications network is proportional to the square of the number of connected users of the system (n2). https://en.wikipedia.org/wiki/Metcalfe%27s_law

Appendix 3 – Token Allocation Detail





Andromeda

Appendix 4 - Token Allocation Table

Pools

Primary	Primary %	Secondary	Secondary %	Amount	Lockup	Vesting	In Circulation	Circulation Amount (Dec '23)
Private Strategic Sale	**12.5%**	Pre-seed	**8.3%**	83,280,000	12	24	**No**	0
		Seed/SAFT	**3.7%**	37,114,494	6	24	**No**	0
		Validator SAFT	**0.4%**	4,336,365	6	24	**No**	0
DAO	**50.8%**	Ecosystem sDAO	**5.0%**	50,000,000	-	-	**No**	0
		Institute sDAO	**5.0%**	50,000,000	-	-	**No**	0
		Validator Bootstrap	**0.4%**	3,500,000	-	-	**No**	0
		Advisors	**3.4%**	34,294,885	12	24	**Partial**	10,000,000
		Validator Incentives	**10.0%**	100,000,000	3	60	**No**	0
		Community Pool	**27.1%**	270,611,757	-	-	**No**	0
Foundation	**11.5%**	Market Maker	**7.0%**	70,000,000	-	-	**No**	0
		Community Incentives	**0.1%**	1,000,000	0	0	**Yes**	1,000,000
		Liquidity Bootstrapping	**2.4%**	24,000,000	-	-	**Partial**	4,500,000
		Operations	**2.0%**	20,000,000	-	-	**Partial**	7,100,000
Labs	**11.2%**	Operations & Business Development	**7.5%**	75,000,000	-	-	**No**	0
		Contractors	**3.7%**	36,862,499	12	24	**Partial**	410,000
Team	**14.0%**	Founders	**14.0%**	140,000,000	12	24	**No**	0
	100%		100%	1,000,000,000				23,010,000