avian

NETWORK

White Paper

version 1.9

INDEX

Abstract. Avian Network is a proof-of-work secured blockchain designed for efficient and interoperable asset management. The network prioritizes usability, automation, and low fees to make asset minting and management simple, affordable, and secure. The network's economy runs on AVN, our native coin that can be mined on a dual algorithm setup using either GPUs or CPUs.

Introduction. Avian Network is an asset management platform designed for efficiency and ease of use for the average user. The assets can be automated using Avian Flight Plans allowing the creation of decentralized applications. The entire network is backed by the native Avian coin, a dual algorithm PoW minable coin.

We believe asset tokenization will play a huge role in modern-day society, with secure privacy-enabled asset transfers fueling globalization. Certain real-world assets can benefit from the efficient, low-cost conversion known as "digital assets" which can be sent to any corner of the world in seconds at a fraction of the cost of mailing or trading real-world assets. With this global expansion comes the need for increased user control and censorship resistance in the issuance and governance of digital assets.

FEES AND USABILITY

The asset minting and management interface will be designed using the average user in mind. The goal is to design an interface and network that allows users to launch businesses, crowdfunds, and communities using tokens that can be minted in the collections in less than an hour at an affordable cost that is more accessible than the most L1 blockchains on the market. At the current state of Avian, $0.0007 /AVN [750k MCAP] and the current minting structure, you can mint a 10,000 token collection for roughly 51,000 AVN or less than $40. This is 1000% cheaper than leading blockchains, without the usability factor which is elaborated later.

ALGO AND COIN

The network is secured by a PoW dual algorithm minable coin called Avian. It can be mined using a GPU on the X16RT algorithm and a CPU mining algorithm, called MinotaurX. This dual algorithm setup for the network has decentralized the network by

improving the distribution of hashrate and giving a whole new class of miners access. The block rewards are 2,500 AVN every 30 seconds, at a maximum supply of 21B coins. The network ensures the constant balanced use of both the X16RT GPU & MinotaurX CPU algorithms - guaranteeing equal rights for each community member to participate in a block. The network transaction fees are one of the lowest in the industry, especially when compared to leading L1 blockchains. Currently, at 0.0007 /AVN (750k MCAP), sending $100 or roughly 142,000 AVN costs only 0.00150150 AVN, or $0.00000105105 in-network fees (that's 10,000th of a penny).

CENTRAL LOCATION

The asset minting and management experience will be in one application, the Avian wallet. Within the wallet, you can not only view, transact, and manage your Avian coin, but will be able to wrap your coins to WAVN for cross-chain operability on Polygon, and soon other networks like ETH. Within the wallet, you will be able to start minting and managing your token collection with ease. The interface will make it easy to decide token quantities, rarities, benefits, and other functionality. Putting all the utilities in one wallet gives the user one central location to work from and it makes the process easier for everyone. Currently, you can run nodes on the wallet but these nodes do not reward the host. It only takes a few clicks and less than 10 seconds to set them up to start contributing to the network and help others sync their wallets.

USABILITY WITH NUMBERS

Having one coin (AVN) makes it easier for users to manage that currency or that ecosystem's currency. It also helps simplify the experience by reducing the need to hop through various other exchanges, DEXs, or bridges to start using the platform. While interoperability is a priority for cross-chain functionality, users shouldn't have to take a crash course on 4 platforms before they can get their coins and start minting.

In terms of numbers, our transaction fees are negligible, but the asset minting fees have a fixed structure that lets you calculate the costs efficiently on the go. Each token in a collection (however many) takes 5 AVN to mint each, you can easily multiply the number of tokens by the price of Avian to predict your costs before you get to the wallet. Most networks not only have you hop through hoops but make the calculations for average users nearly impossible to calculate until you get on the platform and start minting.

UTILITY

In terms of utility, most top-performing blockchains require you to have a good technical background or know a different programming language. It is technically beyond the average user to not only launch a token collection, predict costs, but develop and code the tokens' basic functionality. We believe everyone has the right to be able to tokenize assets, as a global innovation designed for the masses it should not be reserved for a specific group or class of investors and users. The wallet will simplify the process of minting and managing digital assets while also making integrating functionality a breeze. You can not only specify quantity and limitation, but you can also design whether your collection is fungible or non-fungible. Users will also be able to build governance functionality as a DAO, messaging for updates and DAO proposals, built-in discount mechanisms, and profit-sharing for token holders using the Avian coin.

AVIAN FLIGHT PLANS

With the added development of Avian Flight Plans (AFP), our version of smart contracts will give developers a chance to build in automation and add utility to the network. In order to allow websites, mobile applications, and desktop applications to make use of the Avian ecosystem, Avian Flight Plans will be in place to aid the developer. The use of assets will be available not only for the average user but also for the developers to harness. Executing flight plans require no fees of any kind and the only required fee is either performing a transaction or minting an asset. Technical information regarding flight plans can be found in Section G.

OPERATIONS

When the project launched on 1st September 2021 the development team did not take any share or allocation for the foundation, running costs, or marketing from the total supply. The foundation and the team operate on donations and personal funds. We play fair at the same level as the entire community. The core team is not compensated in any way, the only way for the team to make money is to mine the coin, buy it at market price, or receive donations from the community. This simple reason has attracted some of the most passionate and self-motivated individuals to our community.

Our fees being low do not facilitate any operational expenses and those fees are awarded to the miners on top of the emissions. The few ways for the foundation to raise any funds through the network would have to be through; donations, merch sales in the future,

asset minting when it is enabled and a possible future modification to the network fees structure. We do not think it is important to have a high fee, or tax the coin and limit its trading activity and use cases from being realized. The true potential of Avian lies in the coins and the networks' token's ability to be efficiently transferred instantly. Though the asset minting fee structure is fixed, this makes it predictable for the users and the foundation in terms of cost, foundation fundraising, and burning for deflation. For the foundation to start compensating and investing funds back into the network, asset minting has to be fully-fledged and used by users around the globe.

About The Team and Foundation

Mission. Avian Network seeks to improve upon the existing foundations by implementing the necessary updates and bug fixes needed to bring the original X16R fork of Ravencoin up to par with modern cryptocurrencies.

A technical and creative audience that will take advantage of the asset creation and management tools to launch endeavors, use tokens as a way to gather and reach a specific group of people, and offer income/profit distribution with the AVN coin.

There are tons of ERC20 tokens built on the Ethereum blockchain. These ERC20 tokens can be capped by supply limits, and special functions can be hardcoded through smart contracts. On the other hand, we see Avian Network being used in 2 primary ways:

- Used for the real-world assets being tokenized like documents, images, artwork, deeds, or any real-world asset or material that could use the benefits of a digital token and its efficiency and security in transfer.
- Instead of currencies or tokens being used to show ownership in a project, Avian Network will make it possible to use digital assets to represent ownership in any group. Whether it be a startup, small business, campaign, crowdfunding, community, fan club, organization, or group of people looking for a network that makes it possible to use tokens (NFTs) as a representation of ownership, access, and rights.

Instead of multiple projects with multiple currencies, we hope to achieve easier usability through the ability to create projects that still operate independently with Web3 functionality, but still use one crypto coin for simplicity and usability, Avian (AVN).

In the future, we hope to build out the ecosystem by increasing usability and easier ways to build-in functionality. Allow creators to modify the utility, functionality, governance, and profit distribution all through tokenized assets. Avian will offer the backbone that runs the whole operation of tokenizing your assets, whether it documents/ images, a new project/business, or even a DAO-based project. One network, one coin, but multiple tokens (NFTs/assets) projects trying to achieve different goals. Upon that we seek to allow users a new way to launch campaigns, groups, events, businesses, organizations,

clubs, and more. We display a visual example on later pages.

Team. As an open community project, the entire core team generally stands between 15 and 20 part-time members and trainees from over 7 different countries. This number may vary throughout the project's lifetime. We would like to iterate that there are no full-time developers on the dev team as of this date. That being said, it doesn't stop us from working on Avian for long hours, and being on the servers long past midnight, constantly making improvements to the network. Every single one of us is dedicated to the project and its success.

We are merely a group of dedicated community members who took matters into their own hands. As such, the speed of development will greatly depend on the number of contributors.

We hope to build a strong community that is hands-on with the project. A community project's foundation is its community and the support of its users. But more importantly the contributions they make to the network, acting in self-interest directly benefits the entire community. We encourage help through development, content creation, marketing, moderation, or in any way possible.

a) Avian Network and Our Algorithms

The Avian Network is driven by the community, which is fully committed to its prosperity. AVN ensures the consistent balanced use of the X16RT GPU & MinotaurX CPU algorithms - guaranteeing equal rights of each community member to participate in block production, with increased user control and censorship resistance in the issuance and governance of digital assets.

Having started development on August 12th of 2021, Avian Network (AVN) is a fork of Ravencoin Classic (RVC), aimed primarily at bringing the means of development back into the hands of the community after RVC had been abandoned by its creators. With the RVC GitHub locked, and software in disrepair, AVN seeks to improve upon the existing foundations by implementing the necessary updates and bug fixes needed to bring the original X16R-based implementation up to par with modern cryptocurrencies. This project is being spearheaded by a group of enthusiasts, representing the interests of the actual RVC community, as opposed to the original fork, which was taken over and maintained by Chinese ASIC manufacturers looking to make a return on their machines after RVN switched to the X16Rv2 algorithm.

Dedicated mining hardware

FPGA stands for **Field Programmable Gate Array**, meaning it can be programmed to virtually do anything. GPUs are fast and efficient computing devices while FPGAs are programmable devices. No algorithm can be fully FPGA resistant due to the key principle of FPGAs: programmability. The best an algo can do is to count on market peculiarities and make it difficult to program thus rendering FPGAs expensive, in terms of both physical cost and effort, to mine on.

ASICs are **Application Specific Integrated Circuits**, which are generally more efficient than FPGAs but rely on custom silicon, which limits their ability to adjust to algorithm changes once produced. Multiple strategies exist to prevent the development of ASIC miners for any given algorithm, with the two most popular solutions being a heavy usage of GPU VRAM and a rotating series of chained algorithms. While neither solution is perfect, the former has a major issue that discriminates against what consumer-grade hardware can be utilized for mining based on VRAM capacity, as well as generating excessive heat in comparison to core-focused hashing algorithms. This limits the viability of older GPUs

and contributes to e-waste, which is why Avian is dedicated to remaining ASIC resistant without VRAM utilization.

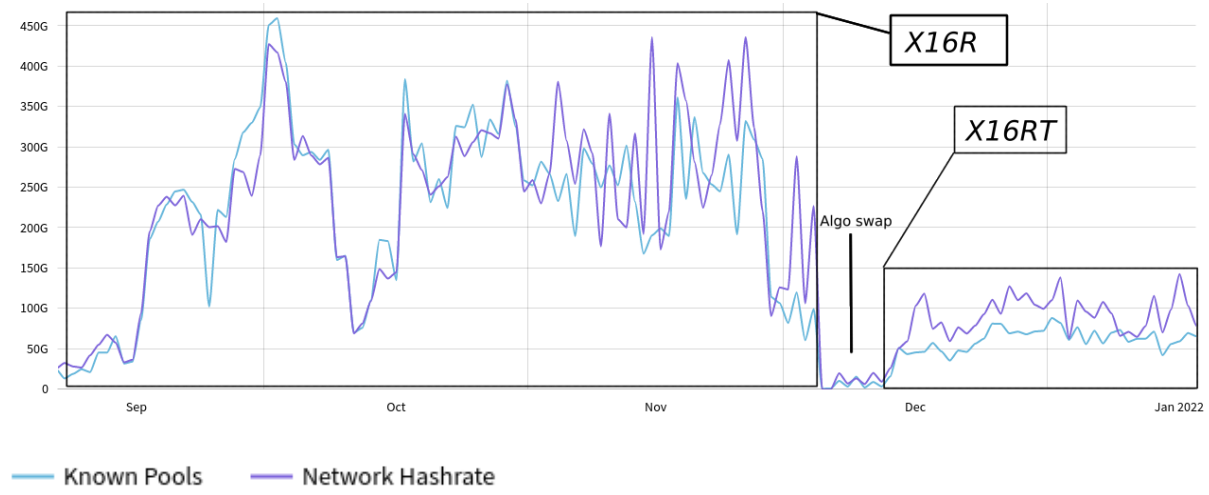
Legacy

The original cryptocurrency, Bitcoin, started Proof of Work (PoW) using the **SHA256** hashing algorithm, but as projects have forked from Bitcoin, it also brought about the use of alternative algorithms. A common goal of these algorithms was to become ASIC-resistant due to the fact that highly efficient ASICs began to dominate SHA-256 due to their simplicity, limiting the viability of decentralization through mining on consumer hardware. Cryptocurrencies like Dash took the initiative to chain multiple algorithms together, creating the family of **X11** algorithms. It was proven to be ASIC resistant, but ASICs for X11 were still eventually developed by Chinese manufacturers.

Another project, Ravencoin (RVN), noticed this and decided to design an ASIC-resistant algo based on the X11 series; they created the **X16R** algorithm. X16R had the same principle of chaining multiple algorithms together, but this time the order of the algorithms was randomized based on the last 8 bytes of the previous hash, contrasting with the sequential nature of previous chained implementations. Due to RVN's early popularity, dedicated mining hardware was eventually developed for X16R, which, despite being highly inefficient, prompted Ravencoin to reverse their course and begin work on a memory-intensive ProgPow variant, temporarily moving to a modified algorithm called **X16Rv2** while development was ongoing.

A group of volunteers wanted to keep the original X16R chain alive and created a new cryptocurrency called Ravencoin Classic (RVC). Unfortunately, X16R and RVC were taken over by Chinese ASIC manufacturers who exploited RVC for profit. A supporter of RVC was upset by this and decided to fork RVC, making a new community-driven cryptocurrency utilizing the X16R algorithm; thus Ravencoin Lite (RVL) was born. The RVL project was faced with many of the same issues which plagued its predecessors and saw the use of dedicated hardware on the network. While the aging and already inefficient ASICs and FPGAs could barely compete with modern consumer GPUs in terms of the hashrate to power ratio, it still went against the decentralized community-driven spirit of the project. Realizing that, RVL performed an algo swap just 3 months into its life, rebranding to Avian Network (AVN) upon the activation of the new PoW system. AVN maintains the original visions of RVL and the projects that came before it by using the

X16RT and MinotaurX mining algorithms (both direct derivatives of X16R) to allow both GPUs and CPUs to join the network.



The X16R background

The X16R algorithm[1] consists of 16 hashing algorithms with the ordering dependent on the last 8 bytes (16 nibbles) of the hash of the previous block. The algorithms are as follows:

Hex (0-F)

0 = blake	1 = bmw	2 = groestl	3 = jh	4 = keccak
5 = skein	6 = luffa	7 = cubehash	8 = shavite	9 =simd
A = echo	B = hamsi	C = fugue	D = shabal	E = whirlpool
F = sha512				

Example:

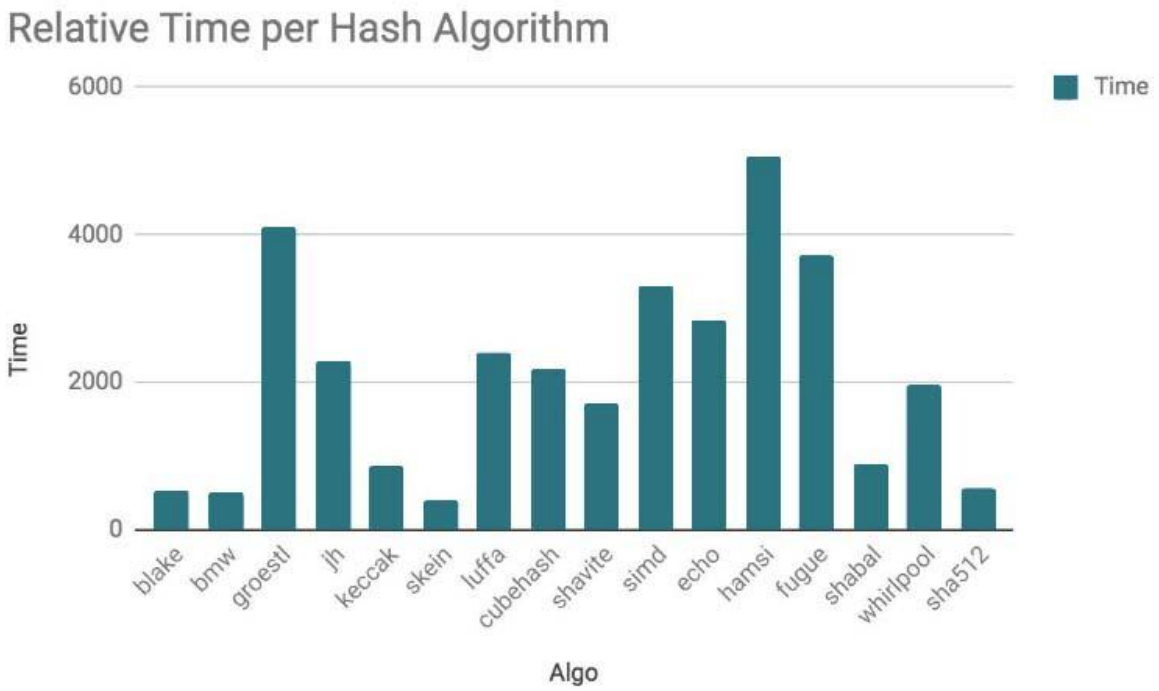
Previous Block Hash:
00000000000000000007e8a29f052ac2870045ae3970270f97da00919b8e86287

[1] Tron B. & Joel W. "X16R"
https://ravencoin.org/assets/documents/X16R-Whitepaper.pdf

The final 8 bytes: 0x7da00919b8e86287

Each hex digit (1 nibble) determines which algorithm to use next.

(7) cubehash → (D) shabal → (A) echo → (0) blake → (0) blake → (9) simd → (1) bmw → (9) simd → (B) hamsi → (8) shavite → (E) whirlpool → (8) shavite → (6) luffa → (2) groestl → (8) shavite → (7) cubehash



Some of the hash algorithms take longer than others. This time difference tends to average out across the 16 algorithms while mining each block.

How does X16RT work?

X16RT is a modification to X16R that makes use of the timestamp of the preceding block as a seed to randomize the next block's algorithm order, as opposed to the previous block's hash. This effectively kicks all existing dedicated X16R hardware off the AVN network, requiring a hardware modification for ASICs to adjust to the new time-based order generation. The idea of introducing time into the equation for determining the order of chained mining algorithms is not unique to Avian, but our solution is extremely

simplistic, fitting in a mere 3 lines of code without introducing any additional complexity, resulting in a lack of observable difference between the two for ordinary GPU miners.

Avian's X16RT implementation vs original X16R ↴

```
84          } else {
85              // x16rt before dual-algo
86              int32_t nTimeX16r = nTime&TIME_MASK;
87              uint256 hashTime = Hash(BEGIN(nTimeX16r), END(nTimeX16r));
88              thash = HashX16R(BEGIN(nVersion), END(nNonce), hashTime);
89          }
90      }
91      else {
92          // x16r
93          thash = HashX16R(BEGIN(nVersion), END(nNonce), hashPrevBlock);
94      }
95
96      return thash;
```

How does MinotaurX work?

MinotaurX (often shortened to minX) is also based on X16R, adding a 17th algorithm, YesPower, into the mix. YesPower is only mineable by CPUs and is strongly anti-GPU. Combining the random aspect of X16R and YesPower allows MinotaurX to be a relatively ASIC/FPGA resistant algorithm while allowing any CPU to participate in the network. It is a simple and lightweight yet modern solution to the CPU algorithm question, which seeks to extract optimum performance from consumer processors. The development of MinotaurX can be traced back to Litecoin Cash (LCC); the original creators of the algorithm. MinotaurX itself is forked from the Minotaur algorithm.

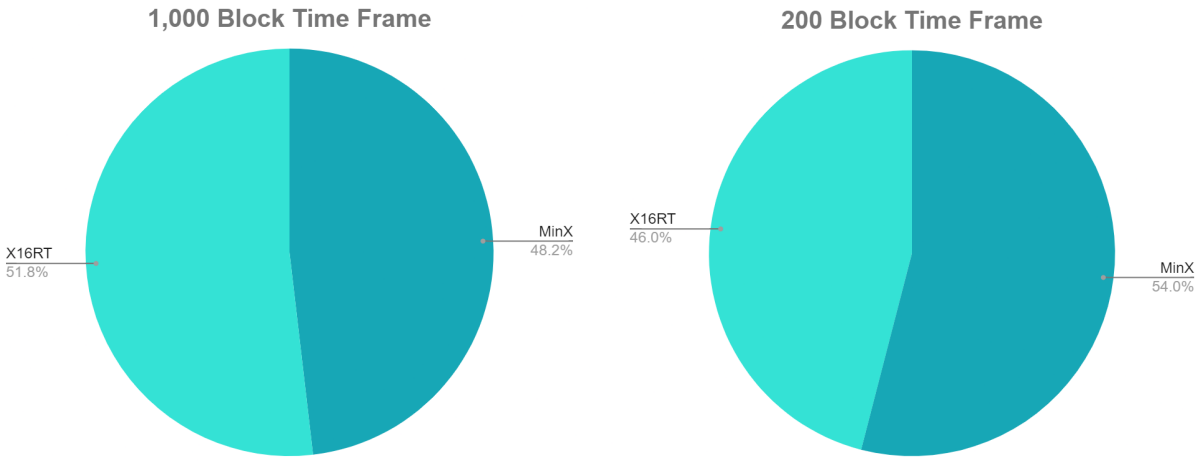
MinotaurX's 17 algorithms are present below:

1 blake	**2** bmw	**3** groestl	**4** jh	**5** keccak
6 skein	**7** luffa	**8** cubehash	**9** shavite	**10** simd
11 echo	**12** hamsi	**13** fugue	**14** shabal	**15** whirlpool
16 sha512	**CPU** yespower			

POW
x16rt
x16rt
minotaurx
minotaurx
minotaurx
x16rt

How does Avian's dual algo system work?

The two algorithms work together by allowing CPU and GPU miners a fair chance at mining AVN coins by utilizing the LWMA-3[2] difficulty algorithm to ensure each algo can only ever get around 50% of the blocks in a given window by using difficulty balancing. In simpler terms, each algorithm is competing to get the next block; in order to give each algo a chance to win, the difficulty fluctuates using LWMA to balance the blocks between X16RT and MinotaurX. Due to the nature of the algorithms, an exact 50% split is not always achieved, but it comes extremely close to it. A graph representing the blocks and respective algorithms can be seen below.



Left: The X16RT and MinotaurX Blocks within a 1,000 block frame. (X16RT 51.84%, MinX 48.16%)
Right: The X16RT and MinotaurX Blocks within a 200 block frame. (X16RT 45.98%, MinX 54.02%)

[2] linearly weighted moving average

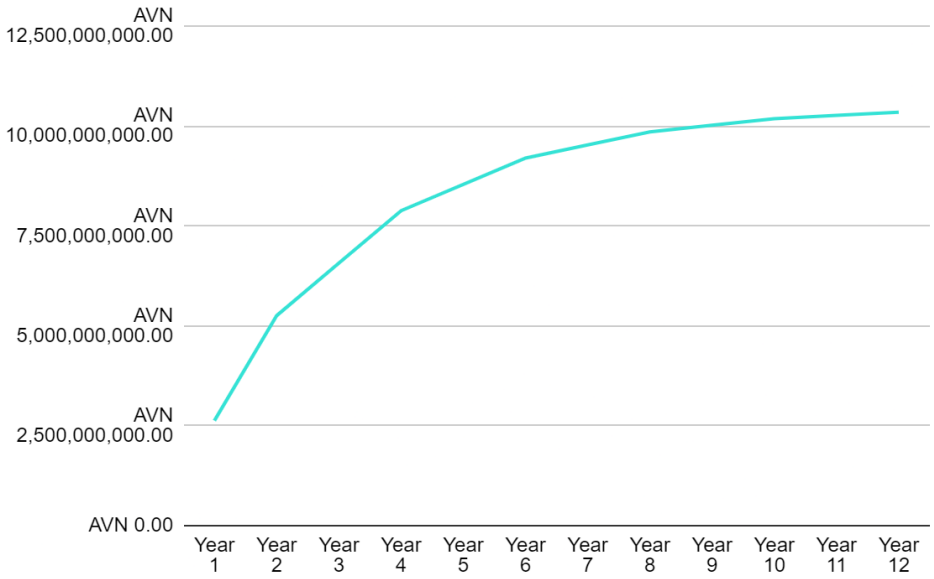
b) Tokenomics 1 (Basic & Mining Emissions)

Block time: 30 seconds
Total Supply: 21,000,000,000 AVN (no pre-mine)
Emissions calendar: 12 years
Total emissions: ≈ 10,347,750,000 AVN

EMISSIONS CALENDAR			
YEAR 1		YEAR 2	
Block Reward	AVN 2,500.00	Block Reward	AVN 2,500.00
Emission	AVN 2,628,000,000.00	Emission	AVN 2,628,000,000.00
HALVING (AVN 2500 to AVN 1250)			
YEAR 3		YEAR 4	
Block Reward	AVN 1,250.00	Block Reward	AVN 1,250.00
Emission	AVN 1,314,000,000.00	Emission	AVN 1,314,000,000.00
HALVING (AVN 1250 to AVN 625)			
YEAR 5		YEAR 6	
Block Reward	AVN 625.00	Block Reward	AVN 625.00
Emission	AVN 657,000,000.00	Emission	AVN 657,000,000.00
HALVING (AVN 625 to AVN 312.5)			
YEAR 7		YEAR 8	
Block Reward	AVN 312.50	Block Reward	AVN 312.50
Emission	AVN 328,500,000.00	Emission	AVN 328,500,000.00
HALVING (AVN 312.5 to AVN 156.25)			
YEAR 9		YEAR 10	

Block Reward	AVN 156.25	Block Reward	AVN 156.25
Emission	AVN 164,250,000.00	Emission	AVN 164,250,000.00
HALVING (AVN 156.25 to AVN 78.13)			
YEAR 11		YEAR 12	
Block Reward	AVN 78.13	Block Reward	AVN 78.13
Emission	AVN 82,125,000.00	Emission	AVN 82,125,000.00

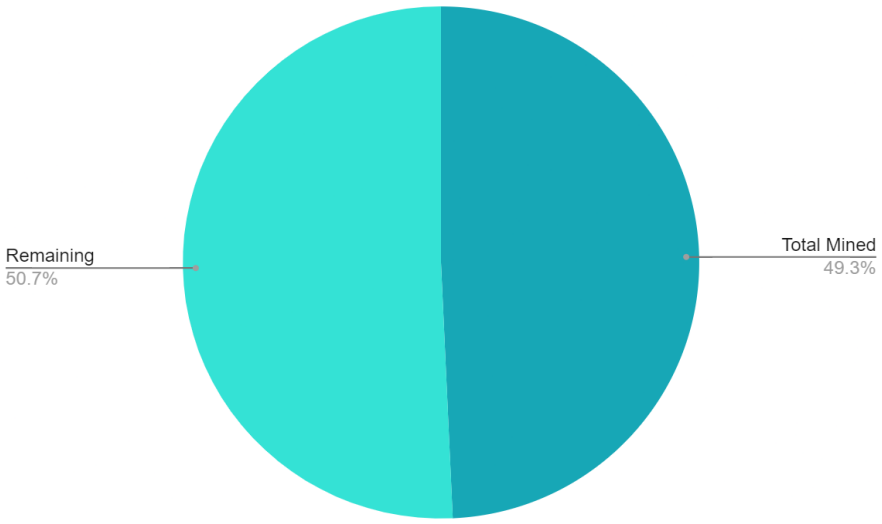
Avian Supply by Mining	
Year 1	AVN 2,628,000,000.00
Year 2	AVN 5,256,000,000.00
Year 3	AVN 6,570,000,000.00
Year 4	AVN 7,884,000,000.00
Year 5	AVN 8,541,000,000.00
Year 6	AVN 9,198,000,000.00
Year 7	AVN 9,526,500,000.00
Year 8	AVN 9,855,000,000.00
Year 9	AVN 10,019,250,000.00
Year 10	AVN 10,183,500,000.00
Year 11	AVN 10,265,625,000.00
Year 12	AVN 10,347,750,000.00



**Graph above represents Avian supply emissions by mining over a 12 year period*

c) Tokenomics 2 (Other Emissions)

Total Mined: ≈ 10,347,750,000 AVN
Remaining Supply: ≈ 10,347,750,000 AVN



Currently, only ≈49.3% of the total 21B supply is going to be mined on a 12-year halving schedule. The remaining 50.7% is going to be distributed by other methods, giving AVN holders another way to take part in the distribution. This method will not include hardware mining algorithms like our existing hybrid GPU and CPU algorithm combination.

This half of the supply has to allow us to:

- ➔ Create a more fair token distribution
- ➔ Increase accessibility for early investors
- ➔ Provide long term value and return to the holders
- ➔ Provide value to the network
- ➔ Be distributed more power-efficient than the other 50%
- ➔ Reduce volatility, provide more stability to the network and price

d) Network Fees Structure

Avian only has transaction fees similar to Bitcoin; there is no private, public, founder, or developer allocation set aside. Transaction fees are based on the size of a transaction which is made up of many inputs and outputs. A single block can hold up to a maximum of 2MB, therefore larger transactions require larger fees. Transaction fees can also determine the speed of the transaction. If there is a backlog of transactions, a higher fee will create an incentive for miners to include it in the next block. When the amount of transactions is lower, the transaction fees are lower. This nature causes the fees to fluctuate based on the number of transactions the network receives. A minimum fee of 0.0005 AVN/kB is required and the wallet will automatically calculate the fee for the transaction. The formulas below can be used to roughly calculate the transaction size and fee.

Transaction size formula

$$S = 148I + 34(1 + O) + 10$$

S = Transaction size (bytes)
I = Number of inputs
O = Number of outputs

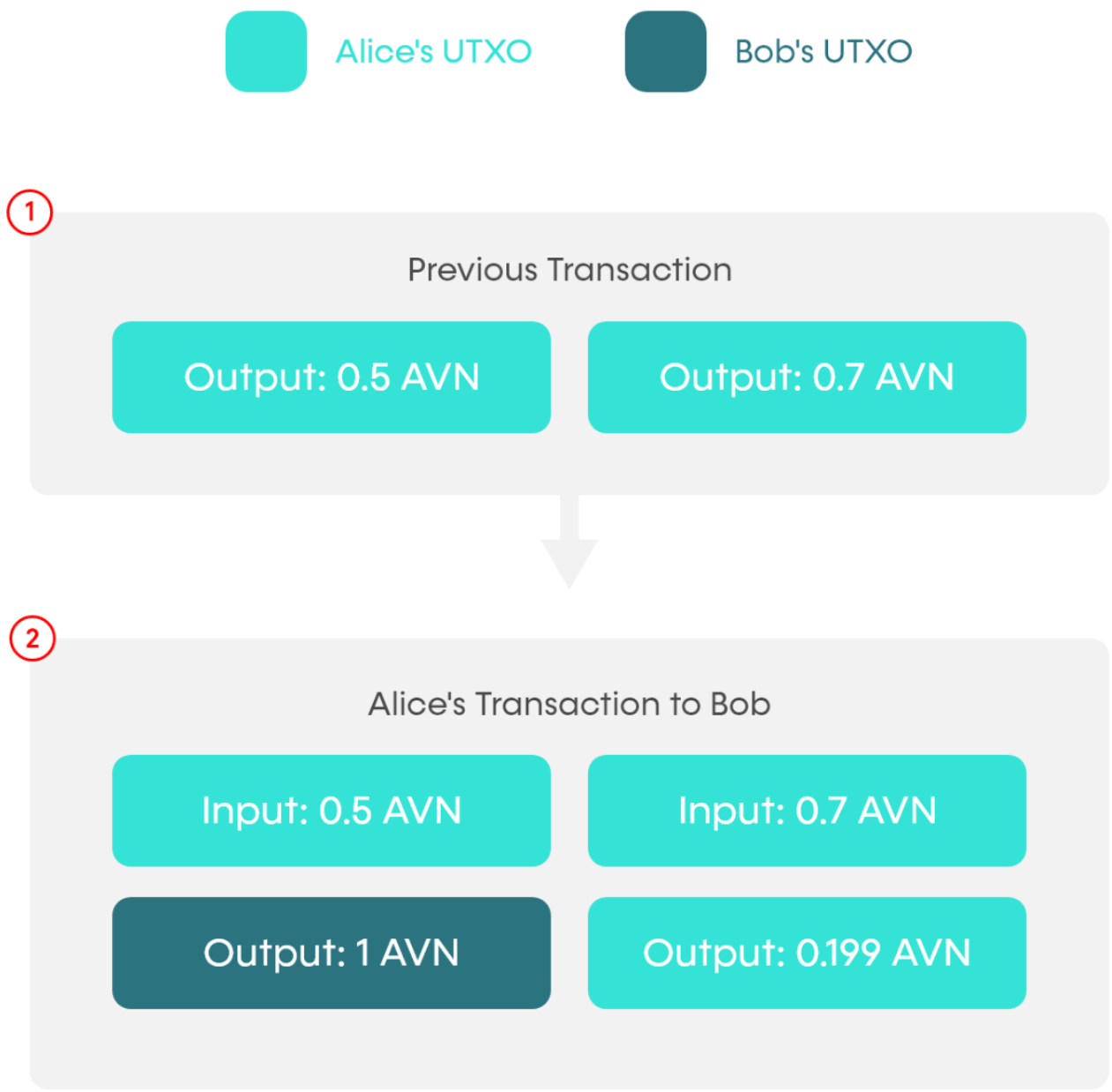
Total fee formula

$$F = \frac{S}{1000} \cdot F_r$$

F = Total fee (AVN)
S = Transaction size (bytes)
F_r = Recommend fee (AVN/kB)[3]

[3] If there is no recommended fee calculated, either do the math by hand or set a large value to guarantee approval

UTXO Model


Alice's UTXO
Bob's UTXO
1
Previous Transaction
Output: 0.5 AVN
Output: 0.7 AVN
2
Alice's Transaction to Bob
Input: 0.5 AVN
Input: 0.7 AVN
Output: 1 AVN
Output: 0.199 AVN

Here's an example of how the transactions are calculated and securely processed on the network:

1. Previous transaction: Let us suppose in transaction 1, Alice received her AVN mining rewards in 2 transactions.

- ➔ **1:** Output of 0.5 AVN
- ➔ **2:** Output of 0.7 AVN

Totals received in 2 amounts of 0.5 and 0.7 are recorded in the blockchain and add up to 1.2 AVN.

2. Transaction to Bob: In transaction 2, Alice sends Bob 1 AVN, and let's see what that looks like.

- ➔ **1:** Input of 0.5 AVN (from the previous transaction)
- ➔ **2:** Input of 0.7 AVN (from the previous transaction)

Here there are 2 amounts of 0.5 and 0.7 that add up to 1.2 AVN; the network does this to verify all the transactions in the senders' history and verify the contents of the wallet.

- ➔ **3:** Output of 1 AVN (To Bob)
- ➔ **4:** Output of 0.199 AVN after fees (Back to Alice)

Here there is an output of 1 AVN which is sent to Bob, and the extra amount remaining is 0.2, which is returned to Alice through a new address called the change address.

e) Assets

What are tokens?

Assets are tokens that can be issued by users of the Avian Network without the need to be mined. Users of the network create these assets and decide their purpose and rules independent of the protocol. These assets or tokens exist on the Avian Network blockchain and could be whatever name, denomination, or purpose selected by the creators of each token. The tokens are transferable and move with the same ease as bitcoin or other similarly functioning cryptocurrencies.

On the Avian Network, an asset is just a limited quantity of a unique symbol, and transferable to any Avian address. Assets created on the network have several advantages: they are easier to use, super affordable, tightly integrated with the native coin, secured with a fair hybrid PoW mining algorithm, easy user experience, and open-source code not run by a centralized organization.

What is the difference between a fungible and non-fungible token?

Fungible tokens or assets are divisible and non-unique. For instance, fiat currencies like the dollar are fungible. A fungible token can also be a cryptocurrency like Bitcoin: 1 BTC is worth 1 BTC, no matter where it is issued.

Non Fungible assets, on the other hand, are unique and non-divisible. They should be considered as a type of deed or title of ownership of a unique, non-replicable item. For example, a flight ticket is non-fungible because there cannot be another of the same kind due to its specific data. A house, a boat, or a car are non-fungible physical assets because they are one-of-a-kind.

The same applies to non-fungible tokens, which represent one unique and indivisible item — physical or intangible — like a picture or intellectual property. Blockchain is the underlying technology that can easily prove ownership of an intangible digital item.

The main difference between fungible assets and non-fungible assets resides in the content they store. While fungible tokens like Bitcoin store value, non-fungible tokens store data like an academic title or an artwork.

Fungible vs. Non-Fungible Tokens		
	Fungible Tokens	Non-Fungible Tokens
Main Features	Divisible	Indivisible
	Non-unique	Unique
	Interchangeable	Irreplaceable
Real-World Purpose	Payment system	Intellectual property
	Store of value	Academic title
	Amount of likes	Artwork
		Music composition
		Gaming
		Utility
		Assets like stocks, shares
		Access to a service i.e., a subscription
Examples of Tokens	Bitcoin; Litecoin; ERC-20	ERC-721
Content Stored	Value	Data

Why focus on asset tokenization?

Existing smart contract-based blockchains and projects show tokenized assets with a wide variety of purposes and structures. Digitally tokenized assets offer several advantages to traditional shares or other participation mechanisms, e.g. faster transfer speed, increased user control and censorship resistance, and a reduction or elimination of the need for a trusted third party.

Neither Bitcoin nor Ethereum was specifically designed for facilitating the ownership of additional assets, and the users and development teams generally prioritize other features. Avian Network is designed to efficiently handle one specific function well: the transfer of assets from one party to another.

What is the need for an asset-focused blockchain?

If the global economy is influenced by actors using various blockchains, then the way capital markets work today could also change. Borders and jurisdictions may become less

relevant as more assets become tradable and trading across borders grows increasingly frictionless. In an age where people can move significant amounts of wealth instantly using cryptocurrencies, global consumers will likely demand the same efficiency for their securities and similar asset holdings whether this is NFT's, asset tracking, data logging the possibilities are endless.

More About Tokens

Token names are guaranteed to be unique. The first to issue a token with a given name is the owner of that token project. The issuer of a token burns 500 AVN and must provide a unique token name. The issuer determines the quantity issued, the number of decimal places, and whether they will be allowed to issue more of the same token in the future.

Assets will be tightly integrated with the GUI wallet and there will be new RPC calls, which will provide intuitive asset management. Easily issue new assets, report current balances, and transfer to other users.

Rewards Allow the payment of rewards in the native token. With a single command the reward, denominated in AVN, is automatically divided evenly and sent pro-rata to the holders of the asset.

For such a global system to work it will need to be independent of regulatory jurisdictions. This is not due to the ideological belief, but practicality: if the rails for blockchain asset transfer are not censorship-resistant and jurisdiction agnostic, any given jurisdiction may conflict with another. In legacy systems, wealth was generally confined in the jurisdiction of the holder and therefore easy to control based on the policies of that jurisdiction. Because of the global nature of blockchain technology, any protocol-level ability to control wealth will potentially place jurisdictions in conflict and will not be able to operate fairly.

Token Minting Structure, Fees, and Burn

1) Core Assets are a one-time cost, and you'll need one to get started
    - ★ Can be minted for 500 AVN
    - ★ 250 AVN or 50% - sent to a foundation wallet for future growth
    - ★ 250 AVN or 50% - will be sent to a burning wallet
2) Collections are under a Core Asset

- ★ Can be minted for 100 AVN
- ★ 50 AVN or 50% - sent to a foundation wallet for future growth
- ★ 50 AVN or 50% - will be sent to a burn wallet

3) Tokens can be created under collections in bigger quantities
   - ★ Can be minted for 5 AVN
   - ★ 3.5 AVN or 70% will be sent to a burn wallet
   - ★ 1.5 AVN or 30% will be sent to the foundation wallet

At the end of the day, we at Avian are building an asset tokenization and management platform for the average user. Backed by an economy that favors the average user and incentivizes holding and minting on Avian.

Future plans

We believe the fees structure for asset tokenization of (500, 100, 5) can be considered quite low or discounted. This means assets can be minted and projects can be built at much lower rates at the initial stages of tokens on Avian. The fees will have room to grow and increase over time. This also increases the foundation budget and scarcity by increasing the burn rate, creating a deflationary effect as the network grows. Coupled with the limited supply, this creates immense value for long-term holders and can help bring some price stability to the network as it grows. This will also create a redistribution opportunity on Avian to long-term holders, adding an additional layer of value. The criteria, rate, or means through which it will be conducted have not been discussed, but it is a part of our vision. When we do get there the community will receive a detailed proposal and dedicated section in the whitepaper.

Core Assets Burn			Core Assets Foundation		
Mints	Burn	Total Burnt	Mints	Foundation	Total Budget
100	AVN 250.00	AVN 25,000.00	100	AVN 250.00	AVN 25,000.00
1,000	AVN 250.00	AVN 250,000.00	1,000	AVN 250.00	AVN 250,000.00
10,000	AVN 250.00	AVN 2,500,000.00	10,000	AVN 250.00	AVN 2,500,000.00
100,000	AVN 250.00	AVN 25,000,000.00	100,000	AVN 250.00	AVN 25,000,000.00
1,000,000	AVN 250.00	AVN 250,000,000.00	1,000,000	AVN 250.00	AVN 250,000,000.00

Collections Burn			Collections Foundation		
Mints	Burn	Total Burnt	Mints	Foundation	Total Budget
100	AVN 50.00	AVN 5,000.00	100	AVN 50.00	AVN 5,000.00
1,000	AVN 50.00	AVN 50,000.00	1,000	AVN 50.00	AVN 50,000.00
10,000	AVN 50.00	AVN 500,000.00	10,000	AVN 50.00	AVN 500,000.00
100,000	AVN 50.00	AVN 5,000,000.00	100,000	AVN 50.00	AVN 5,000,000.00
1,000,000	AVN 50.00	AVN 50,000,000.00	1,000,000	AVN 50.00	AVN 50,000,000.00
10,000,000	AVN 50.00	AVN 500,000,000.00	10,000,000	AVN 50.00	AVN 500,000,000.00

Tokens Burn		
Mints	Foundation	Total Burnt
100	AVN 3.50	AVN 350.00
1,000	AVN 3.50	AVN 3,500.00
10,000	AVN 3.50	AVN 35,000.00
100,000	AVN 3.50	AVN 350,000.00
1,000,000	AVN 3.50	AVN 3,500,000.00
10,000,000	AVN 3.50	AVN 35,000,000.00
100,000,000	AVN 3.50	AVN 350,000,000.00
1,000,000,000	AVN 3.50	AVN 3,500,000,000.00

Tokens Foundation		
Mints	Foundation	Total Budget
100	AVN 1.50	AVN 150.00
1,000	AVN 1.50	AVN 1,500.00
10,000	AVN 1.50	AVN 15,000.00
100,000	AVN 1.50	AVN 150,000.00
1,000,000	AVN 1.50	AVN 1,500,000.00

10,000,000	AVN 1.50	AVN 15,000,000.00
100,000,000	AVN 1.50	AVN 150,000,000.00
1,000,000,000	AVN 1.50	AVN 1,500,000,000.00

f) More About Tokens & Use Cases

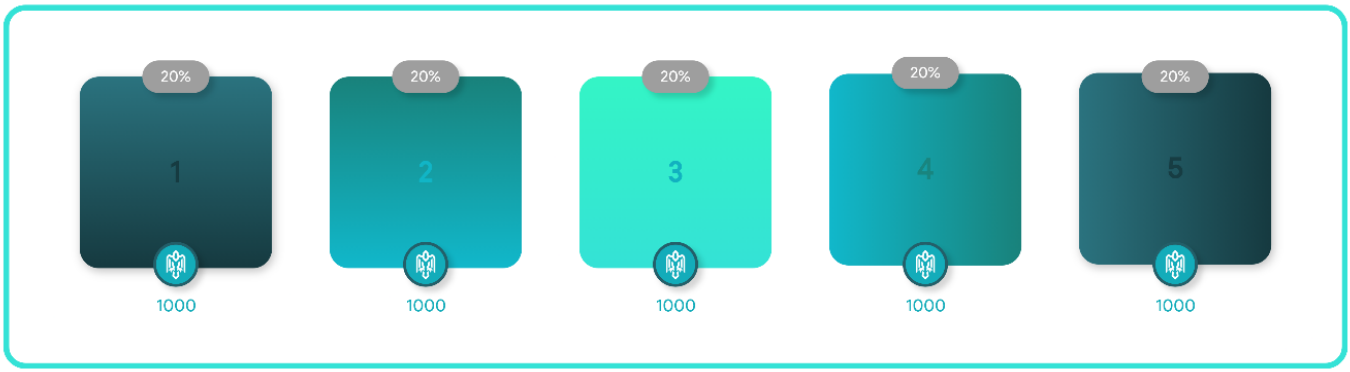
Asset Token Structure on Avian

Every user pays **500 AVN** as a one time fee to initiate the **core wallet** and enable the creation of collections

Collections are groups of tokens that can be used to categorize projects. Each collection costs **100 AVN** to create

A user may create as many **tokens** as they desire within each collection. Each token on Avian costs **5 AVN** to mint

Asset Profit Distribution in Avian

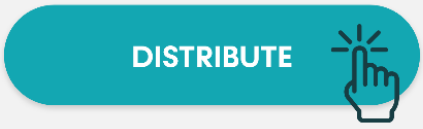


The price used for the following examples are $1 /AVN

5 friends start a venture, each member mints a token which represents 20% ownership.

This venture generated $5,000 in net profit the first month.

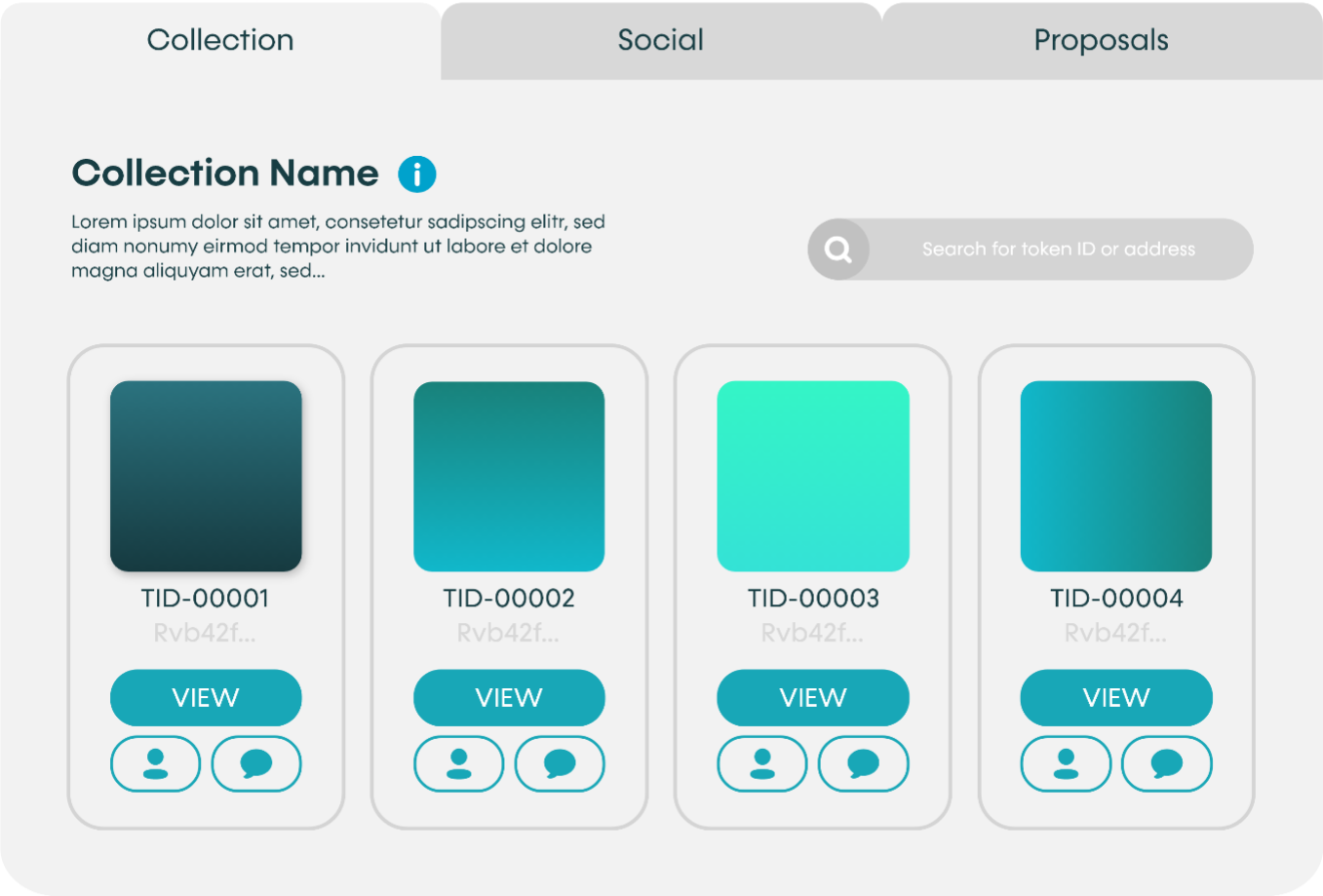
5,000 AVN needs to be distributed equally to all members



with one click you'll be able to distribute specified amounts equally or based on custom proportions.

The amount is evenly distributed - 1,000 AVN to each member

The Avian DAO/ Token Experience (Collections)

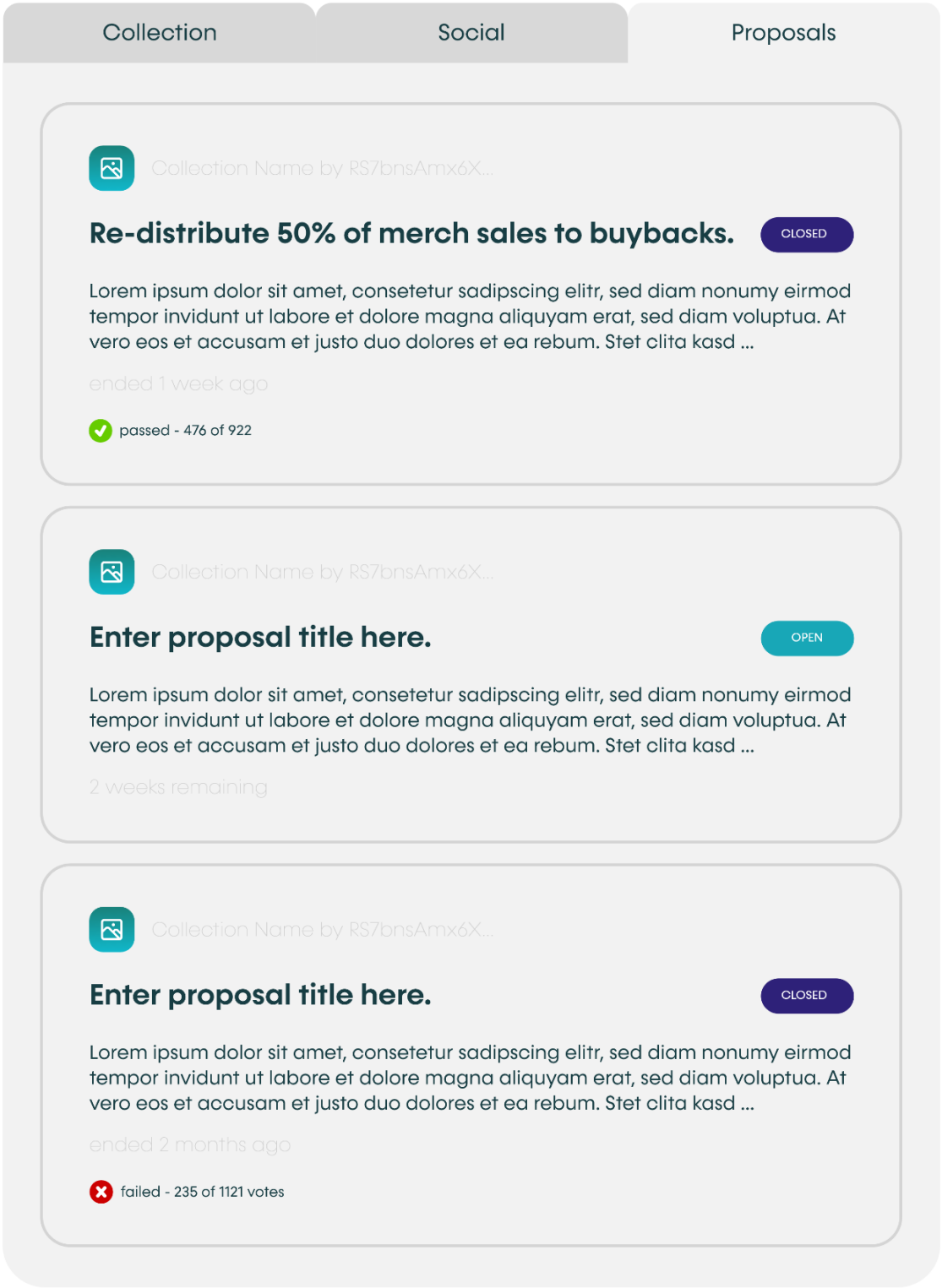


The Avian token experience begins at the collection page where you can view project and specific token information.

You can even view each token up close, contact the owner or view the owners collection profile for more information.

You scroll through the entire collection and search tokens by their token ID or by the owners wallet address.

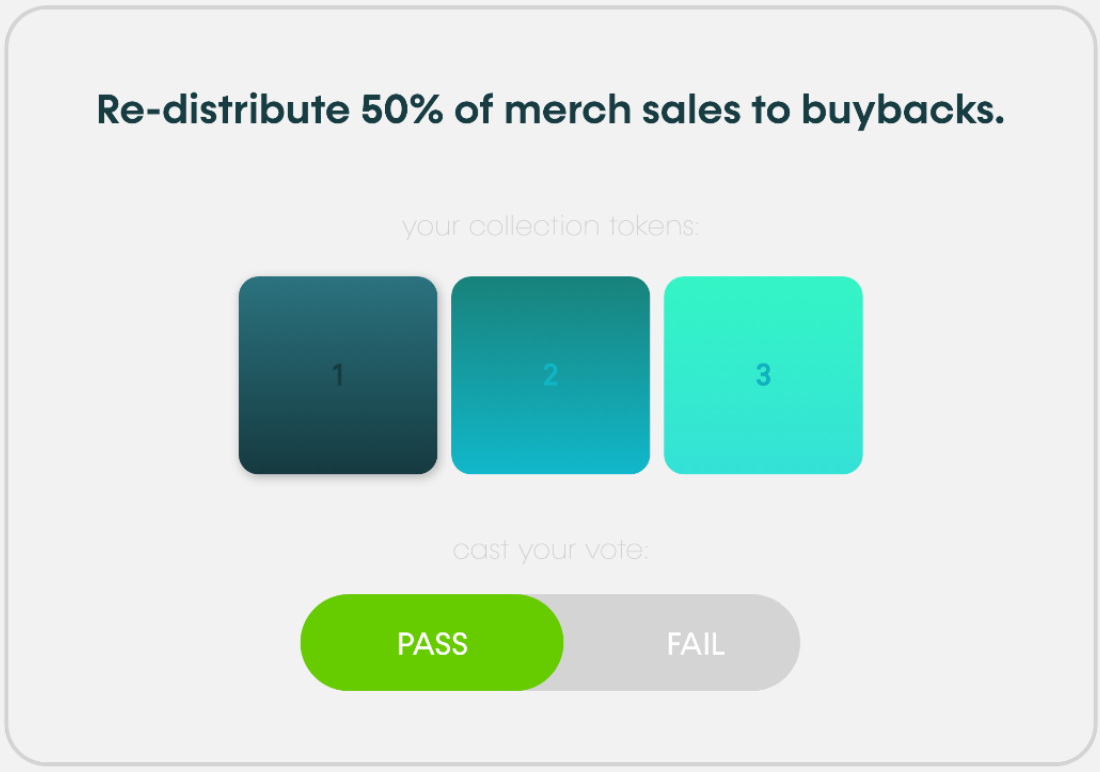
The Avian DAO/ Token Experience (Proposals)



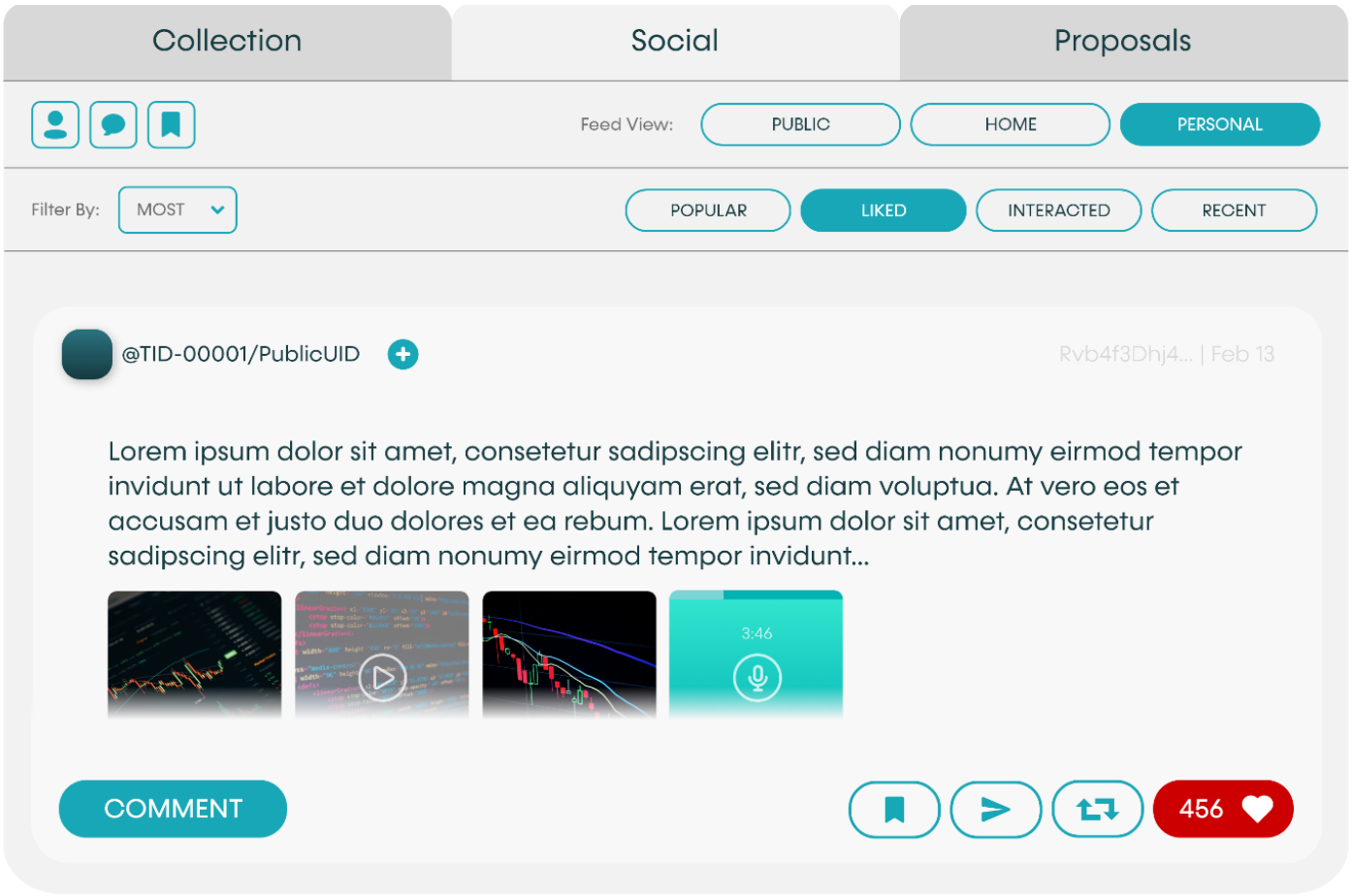
Each proposal shows its status, results and can be clicked for more information about the proposal and its content.

Members of the collection can create proposals and vote on existing ones created by their community using their tokens.

Votes are casted based on the tokens held in that collection. Voting power between holders is either fixed or as specified.



The Avian DAO/ Token Experience (Socials)



Collection members will have access to their own private social experience with the other members.

Members will be able to edit their public profile (optional), add fellow members, and DM them as well.

Members can share copy, images, videos, voice recordings, and links while having the ability to comment, like, share and re-post.

The public feed displays content from all token members including the collection

The home feed displays all the content posted directly by the collection owner.

The personal feed displays your posts and posts from token holders that you follow.

Each members social ID or @ will be their token ID or a chosen nick name. Posts will display the token, ID/ name, and wallet address.

Members will have the option to add friends through the collections page and through the social feeds.

Ability to interact with posts by either bookmarking, linking, commenting, reposting or sharing directly to a token member.

Avian Tokens in the Real World

The price used for the following examples are $1 /AVN

THE WILLOW

Two brothers John and Mickey want to start a restaurant in their local neighborhood, called the willow.

John a Mickey need to raise $300,000 to get their first location up and running and cover a year worth of costs.

They mint the following tokens to raise money while offering rewards in return.

Minted Specifically for John and Mickey

Tokens Mined: 2

Token Price: $60,000

Voting/ Ownership: 20%/ 20%

Total Raised: $120,000

Total Voting/ Ownership: 40%

Minted for Public Sale

Tokens Mined: 2

Token Price: $15,000

Voting/ Ownership: 5%/ 5%

Total Raised: $60,000

Total Voting/ Ownership: 10%

Tokens Mined: 10

Token Price: $6,000

Voting/ Ownership: 2%/ 2%

Total Raised: $60,000

Total Voting/ Ownership: 20%

Tokens Mined: 15

Token Price: $3,000

Voting/ Ownership: 1%/ 1%

Total Raised: $45,000

Total Voting/ Ownership: 15%

Tokens Mined: 45

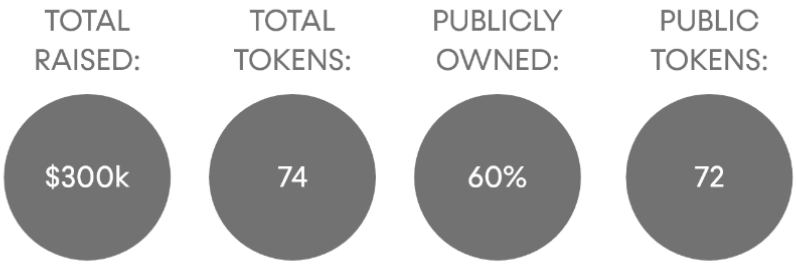
Token Price: $1,000

Voting/ Ownership: 0.33%/ 0.33%

Total Raised: $45,000

Total Voting/ Ownership: 15%

Tokens /tier	2	2	10	15	45
Price /ea	$60,000	$15,000	$6,000	$3,000	$1,000
Voting /ea	20%	5%	2%	1%	0.33%
Ownership /ea	20%	5%	2%	1%	0.33%
Total Ownership	40%	10%	20%	15%	15%
Total Voting	40%	10%	20%	15%	15%



John and Mickey minted a total of 74 tokens to represent ownership and governance rights to their new business.

They personally own 40% of the business for $120,000 and will own 2, $60,000 tokens to represent their share and rights in the business.

They mint 72 more tokens for public sale that represent 60% of the business, looking to raise a total of $180,000.

Each tier has a different price, has different voting and ownership percentages, and benefits.

Each tier included benefits from its tier and the pervious, creators can design their own verifying mechanism, this example uses QR codes.

The creators charge token holders a 25% fee on profit net profit amount as they run most of the day to day operations.

The Willow can now not only get in business but can build a community while efficiently managing investors, governance and profit distribution.

We build the tools so you can build the DAOs of the future, within minutes.

g) Avian Flight Plans (Smart contracts)

What are smart contracts?

[4]A smart contract is an executable contract with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. The code controls the execution, and transactions are trackable and irreversible. Smart contracts permit trusted transactions and agreements to be carried out among disparate, anonymous parties without the need for a central authority, legal system, or external enforcement mechanism.

Why not use traditional smart contracts?

Other token standards like ERC20, ERC721, and ERC223 are built on Ethereum or other blockchains (EVM'S) that support smart contracts. Different problems exist when using these smart contracts. Since the Ethereum network does not natively recognize these smart contract tokens, it is currently unable to protect against some common problems. Smart contracts can be confusing for users as there can be multiple ERC20 tokens with identical names. The only distinction between contracts with identical names is the contract hash.

The solution is to create a bitcoin-like system that is fully asset aware. A system being asset aware provides two major advantages. First, it allows the client and RPC commands to protect the asset from being destroyed accidentally. Second, it allows a single native client to issue, track, and transfer the assets. Lastly, to provide security for the underlying assets, the bitcoin-like system functions only with a market value, a strong mining community, and wide distribution. An alternative to the "smart contract" system will be in place to support the automation of assets.

As stated above, users of the network can create assets and decide their purpose and rules independent of the protocol. To further leverage and automate the use of assets,

[4] https://www.investopedia.com/terms/s/smart-contracts.asp

flight plans[5] can be used to assist in this task. Flight plans allow the users to design their own protocol according to their needs, allowing further control over assets.
Assets themselves alone can be transferred, minted, etc. We want to further unlock the capabilities of assets by developing a smart contract system to allow developers to have greater control and automation over assets. Although RPC commands exist for token management, a scripting language will allow more control and help with readability as opposed to using multiple RPC methods.

Real-Life example

NOTE: *The following example is purely fictitious and does not showcase the final product. The sole purpose of this example is to provide a basic workflow on how smart contracts can be used.*

Let's suppose a simple example. A social media website wants to keep track of a like counter and wants to use the Avian blockchain to keep track of a decentralized matter.

This would be their workflow:

1. Install an Avian wallet
2. Write code
3. Deploy code to Avian blockchain
4. Hook website to call flight plan function

Let's write the smart contract →

[5] *Can be compared to smart contracts*

```lua
-- This is a proptype AVN smart contract (subject to change)
-- For a like counter on a website like Instagram or YouTube.

-- This creates a function to add likes
function addLike ()
  -- Create 1 asset called "Like Count"
  avian.createAsset("Like Count", 1)
end

-- This creates a function to get the like count
function likeCount ()
  -- Returns to amount of "Like Count" assets in supply
  return avian.getAsset("Like Count").amount
end
```

Figure 1 - An example of an Avian flight plan written in Lua.

How to call the functions?

We will create a new RPC method called:
`call_function [flight plan name] [function name] [args]`

```
$ avian-cli call_function "Like Smart Contract" "addLike"
Done.
$ avian-cli call_function "Like Smart Contract" "likeCount"
120
```

Figure 2 - An example of calling an Avian flight plan via the RPC

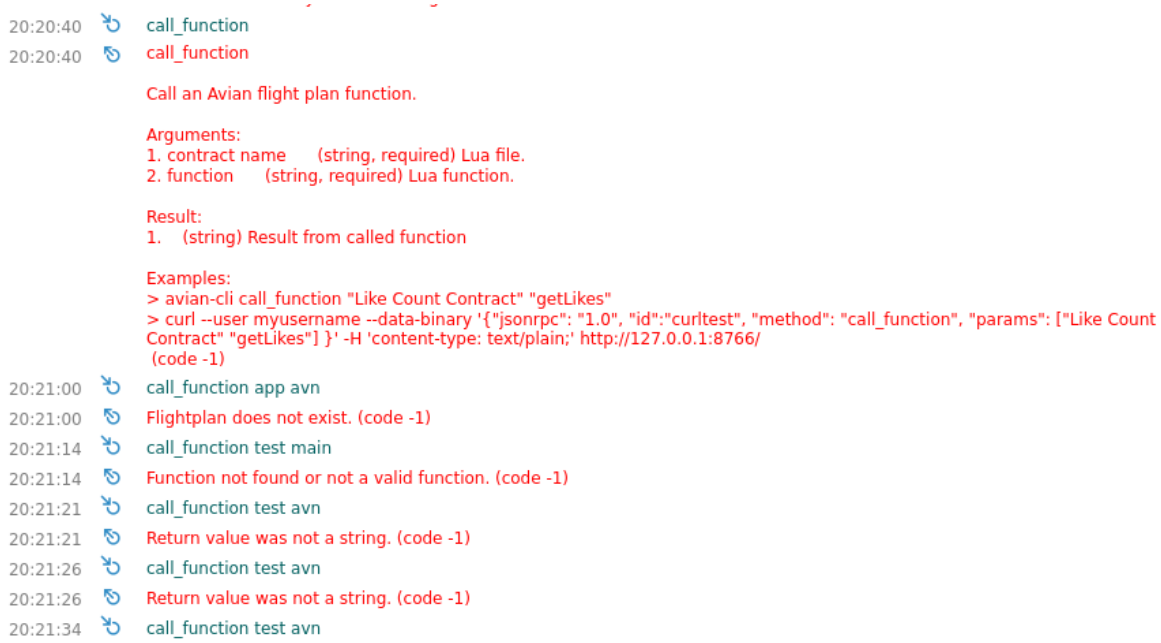


Figure 3 - `call_function` being called in RPC Console which shows error checking

How would you show the likes on the website?

Since we will add a new RPC call to allow users to call flight plan functions, any RPC library should work. This means almost any programming language that supports HTTP calls can use Avian smart contracts. *Figure 3* will show a simple example in React which is a popular frontend framework.

```
// This is a real require
let avian = require('node-bitcoin-rpc');

// Connect to local Avian wallet
avian.init('localhost', 7895, 'user', 'pass');

function LikeCount() {

  var likeCount = 0

  avian.call('call_function', ["Like Smart Contract", "likeCount"], function (err, res) {
      if (err !== null) {
        console.log(`Oh no! Error!! ${err} ${res.error}`)
      } else {
        console.log(`Yay! We got: ${res.result}`)
        likeCount = res.result
      }
  })

  return (
    <h1>Like Count: {likeCount}</h1>;
  )
}
```

Figure 4 - Example React code using RPC to interact with a flight plan to display the like count.

How would we add this to Avian?

Using Lua as a scripting language will allow us to embed it in C++ which means we can easily connect our RPC and other functions to it easily. Refer to *Figure 6* to see how this can be implemented in a UTXO model, and *Figure 6 for a local model.*

UTXO Model

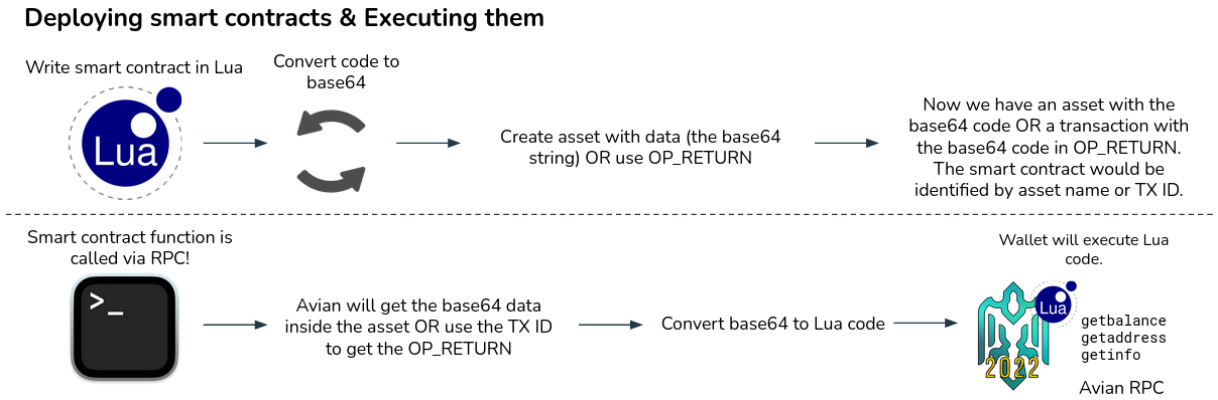


Figure 5 - Infographic explaining deploying contracts and executing them.

Local model

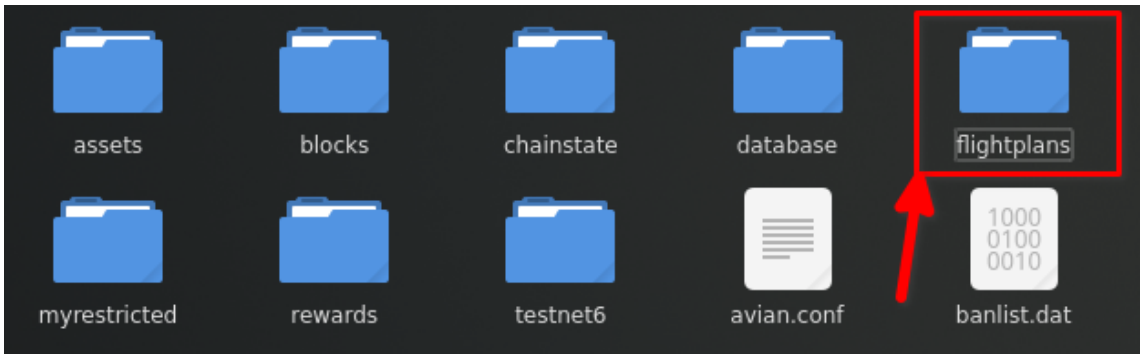


Figure 6 shows the data-dir folder containing a new folder called "flight plans" to store the contracts.

Creating a DNS system using Avian flight plans

Example 1

Let's create a DNS system using Avian flight plans! Our current DNS is used to convert domain names such as "avn.network" to their correct IP address. Unfortunately, DNS is centralized, so let's take the opportunity to use assets and smart contracts to create a basic DNS system in Avian. *Note: This example is theoretical and only serves to show how flight plans can be coded.*

```
-- Avian port of SimpleDomainRegistry from Ethereum smart contract examples

local owner
local DOMAIN_NAME_COST = 1 -- Costs 1 AVN to create domain

-- Registers a domain name, domainName can be something like "avian.app"
function register (domainName, ip)

  if avian.localWallet.balance <= DOMAIN_NAME_COST
    return "Insufficient amount."
  else
    -- By default, you can not create an asset with the same name
    local result = avian.createAsset(domainName, 1, ip)
    return result
  end

end

-- Return the IP of a domain name
function getIP (domainName)
  return avian.getAsset(domainName).metadata
end
```

Figure 5 shows the code to implement our decentralized DNS flight plan.

Querying blockchain

Example 2

```
function rnd_hash()
    height = math.random(1, 3000)
    return avian.blockchain.getblockhash(height)
end

function info_hash()
    block = json.decode(avian.blockchain.getblock(rnd_hash()))
    time = os.date("%x", block.time)
    return "Result: " .. time
end
```

Linking to Python

Example 3

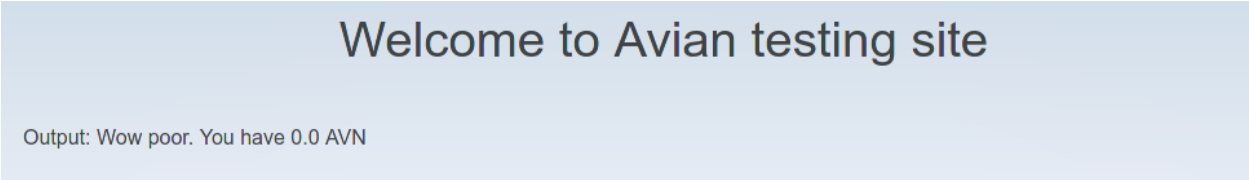
```
~ via 🐍 v3.10.1
❯ python3 app.py
Contract name: test
Function: balance
Wow poor. You have 0.0 AVN
```

```
from bitcoinrpc.authproxy import AuthServiceProxy, JSONRPCException

# set rpc_user and rpc_password
rpc_connection = AuthServiceProxy("http://%s:%s@127.0.0.1:7895"%(rpc_user, rpc_password))
result = rpc_connection.batch_([["call_function", "<contract name>" "<function>" "<args>"]])
print(result)
```

Linking to Web using SvelteKit

Example 4

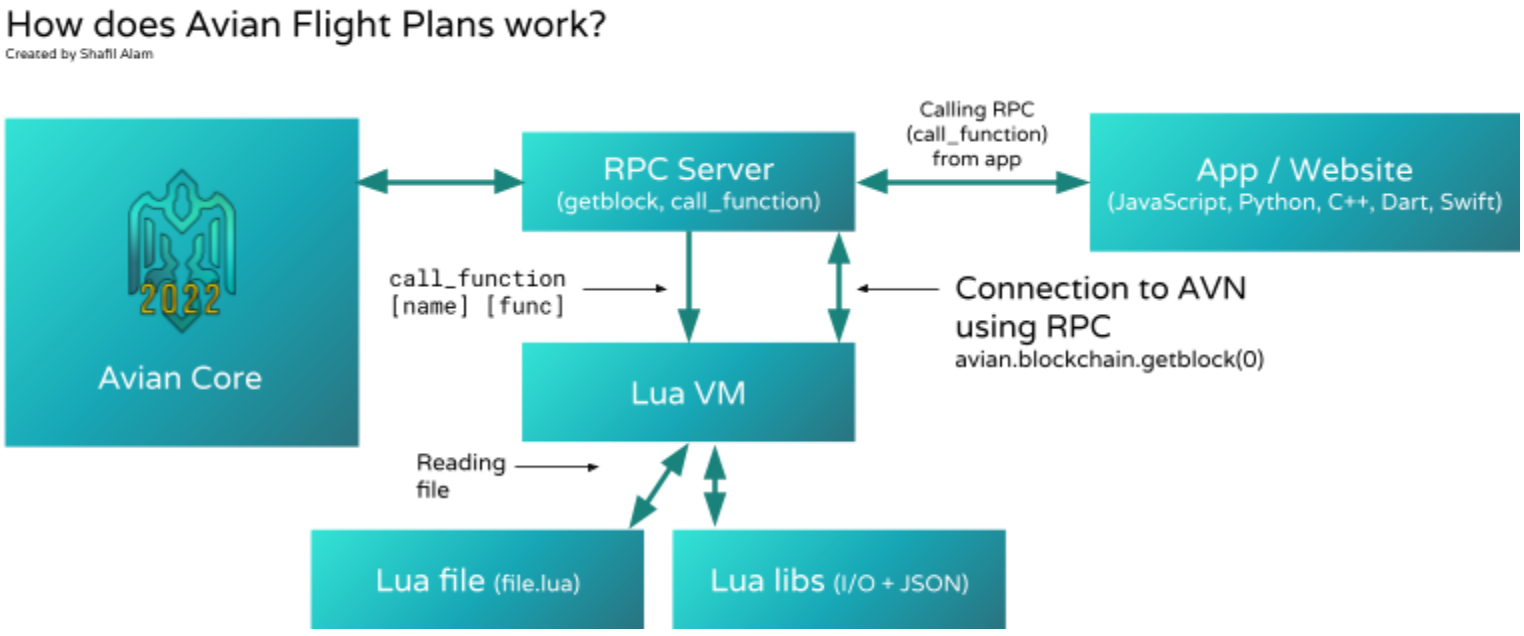


Server side rendering using Svelte Kit and NodeJS ↑

```
<script context="module">
    let result = "Waiting";
    import * as avian from 'node-bitcoin-rpc'
        avian.init('localhost', 9000, 'rpc-username', 'rpc-password')

        avian.call("call_function", ["test", "balance"], function (err, res) {
            result = res.result;
        });
</script>

<h1>Welcome to Avian testing site</h1>
<p>Output: {result}</p>
```



h) Wrapped Avian on Polygon (WAVN)

This paragraph is hypothetical and completely dependent on the future direction, community contribution, and effort. This is important to mention to put the full ability of the concept into perspective. There are 2 avenues for interoperability once the network has assets fully enabled and tradable.

What is WAVN?

Wrapped Avian powers the Avian Network with the flexibility of an ERC20 token and the EVM ecosystem. Wrapped Avian (WAVN) is an ERC20 token on the Polygon Network[6], backed 1:1 with Avian and completely transparent. Safe to use on DEXs, Dapps, ledgers, and many more.

Why WAVN?

WAVN brings liquidity to the Ethereum ecosystems including decentralized exchanges (DEXs) and financial applications. WAVN further allows the use of DAO's, yield farms, smart staking, lending, and allows further implementation of ERC-20 functionality with the backing of host-chain Avian. Many projects on other networks suffer from the complexity of multiple currencies and their interoperability, it's intimidating and requires a lot of clicking and navigating. Our ecosystem will allow projects from other platforms to possibly integrate with Avian, preserving the utility on their native blockchain. But using Avian as a way to better manage communities, rewards, ownerships, voting, messaging, access, discounts, and more. All delivered in one easy-to-use currency and ecosystem.

For developer docs visit: https://docs.avn.network

[6] https://polygon.technology/

i) Road Ahead, Milestones

We believe in the principle that a public chain should have long-term consistency, so AVN will adhere to using the same X16RT algorithm. However, an algo change can be facilitated if desired by the community at large. This is just a list of general milestones that we have to hit to get the network to where we want it. The status on each milestone isn't specified, while many milestones have been reached, some are in process or review, the exact status can be found on our website.

The current roadmap of milestones include, in no particular order:

- ☐ A complete rebranding to Avian Network
- ☐ Increase accessibility through WAVN on Polygon MATIC
- ☐ Develop the block explorer interface and experience
- ☐ GPU algo swap, Eliminate ASIC hashrate on X16R - switched to X16RT
- ☐ CPU algo add, Decentralize mining hashrate and increase accessibility- Minotaur
- ☐ Re-write whitepaper to clarify the vision and direction of the network
- ☐ Bridging Avian into other EVM chains for DEX liquidity (WAVN deployed on polygon).
- ☐ wBTC type custodian-wrapping Avian into WAVN deployed
- ☐ Liquidity and Active trade established on Sushiswap (WAVN)
- ☐ List on tracking sites like CoinMarketCap, CoinGecko, and other trading platforms
- ☐ Ease access through automatic wrapping and unwrapping for WAVN on Polygon MATIC using Avian Flight Plans (AFP)
- ☐ Complete desktop wallet redesign, better UI, access to information, and asset creation and management experience
- ☐ Rewrite fee to reduce spam transactions, introduce coin burn and increase the foundations budget for more investment
- ☐ Establishment of a new website with a new road map and a blog section that represents the Avian Foundation.
- ☐ Plan 50.7% emissions through other non-mining mechanisms that provide the community with long-term value and further increase network accessibility for investors

- ☐ Possibly work on an asset/token marketplace to allow for the community a general location to trade tokens based on Avian Network
- ☐ Develop token functionality and usability; profit redistribution in AVN, on-chain voting and governance, token holder messaging/ chat
- ☐ Work on a limited native token (NFT) launch, with a possible play at network governance, tokenized DAO
- ☐ Reintroduction of support for assets, creation, and management through our wallet (in multiple phases)
- ☐ Restructure team to improve handling in marketing, strategic partnerships, social media, development and content creation
- ☐ Making it possible to hold Avian on a mobile and web wallet
- ☐ Recreate asset minting and management experience with the broader audience in mind
- ☐ Explore WAVN integrations to other protocols
- ☐ Listing of WAVN on DEXs and development of Yield farms and Syrup pools

j) Public Addresses and Links

AVN Foundation Address: RFdvps1Boq6SngTV3STnCE9DKvnQLTSGMX
Wallet on block explorer:
https://explorer.avn.network/address/RFdvps1Boq6SngTV3STnCE9DKvnQLTSGMX

AVN Donation Address: RDs4A4sDHp4otDHQQuFSaPDYEg2xx3hbdN
Wallet on block explorer:
https://explorer.avn.network/address/RDs4A4sDHp4otDHQQuFSaPDYEg2xx3hbdN

AVN Burn Address: RXBurnXXXXXXXXXXXXXXXXXXXXXXWUo9FV
Wallet on block explorer:
https://explorer-us.avn.network/address/RXBurnXXXXXXXXXXXXXXXXXXXXXXWUo9FV

WAVN Wallet Address: RGqVXiGTK59MEfyL19PMPiHT4532TvCDY9
Wallet on block explorer:
https://explorer.avn.network/address/RGqVXiGTK59MEfyL19PMPiHT4532TvCDY9

Block explorer US: https://explorer-us.avn.network/
Block explorer EU: https://explorer-eu.avn.network/
Block explorer AP: https://explorer-ap.avn.network/

WAVN Token Address: 0x752dc265eaf6da2db0f8e4a32d5596d3f18e8701
WAVN Polygon Explorer:
https://polygonscan.com/token/0x752dc265eaf6da2db0f8e4a32d5596d3f18e8701
WAVN SushiSwap Dashboard:
https://analytics-polygon.sushi.com/pairs/0xc39fdd7e2036c6ca56fa32ccc277210a4c4ce4d1
WAVN docs: https://docs.avn.network

Website: www.avn.network
GitHub/ Source code: https://github.com/AvianNetwork/Avian
Discord: Avian network | https://discord.gg/u7FxHdyFrQ
Twitter: @avianfounation | https://twitter.com/avianfoundation
Reddit: r/aviannetwork | https://www.reddit.com/r/aviannetwork/

Facebook: Avian Network [AVN] | https://www.facebook.com/groups/aviannetwork
Telegram: Avian Network | https://t.me/AvianNetwork

Conclusion

Avian Network is a platform coin built on the UTXO model of Bitcoin. Modifying Bitcoin code to add these capabilities is not practical, but Avian Network is a platform built on X16RT and an efficient CPU algorithm called MinotaurX. This 50/50 split of block rewards between 2 mining classes helps decentralize the hashrate and mining rewards to build a more fair future for Avian as an asset management ecosystem. Avian Network will be adding assets, rewards, unique assets, messaging, and voting. The network's capabilities will be rolled out in phases which will be done as a planned hard fork upgrade. The codebase is designed to allow users and developers to maintain a secure and decentralized network.

The Avian project can also serve as a base and starting point for projects, second layer solutions, experiments, and business ideas that might benefit from either the Bitcoin-based code base with adjustments, more efficient decentralized hybrid token distribution, or the native additional features added to the Avian Network.

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References

[1] Satoshi Nakamoto, “Bitcoin”
https://bitcoin.org/bitcoin.pdf
[2] Tron B. & Joel W. “X16R ASIC Resistant by Design”
https://ravencoin.org/assets/documents/X16R-Whitepaper.pdf
[3] Bruce F. & Tron B. “Ravencoin”
https://ravencoin.org/assets/documents/Ravencoin.pdf
[4] Jake Frankenfield, Investopedia “Smart Contracts”
https://www.investopedia.com/terms/s/smart-contracts.asp
[5] Cointelegraph “Fungible vs non fungible tokens: What is the difference?”
https://cointelegraph.com/nonfungible-tokens-for-beginners/fungible-vs-nonfungible-tokens-what-is-the-difference