



Knox Project

File Secure



Whitepaper V 0.4



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Prelude

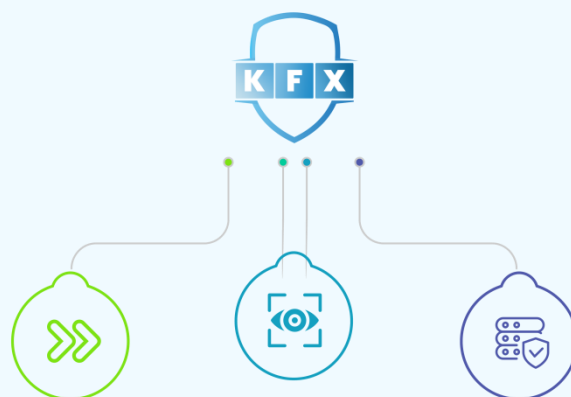
The notes within this Whitepaper publication are intended to formally document the concepts, vision, and features of the KnoxFS cryptocurrency (KFX). This document will explain in a methodical manner, the details of KnoxFS currency, its structure, purpose and its use case. Before downloading any of the KnoxFS wallets and purchasing the coin, we urge people to thoroughly read through and understand this document in its entirety. It is important to note that KnoxFS is NOT a security-based coin nor are there any guarantees or promises relating to the increase or decrease in value of the coin over any period of time. This coin, KFX should be purchased solely at the discretion of the purchaser and any technology outlined in this document is primarily experimental and does not bring with it any guarantees or certainties regarding operation and intended purpose. We hope you enjoy the KFX Whitepaper, and if you have any questions concerning it, please join our Discord Group or simply email us at - contact@knoxfs.com

About KnoxFS

KnoxFS is a Bitcoin-based cryptocurrency with a focus on decentralized data storage, distribution, privacy, and security. It aims to provide an innovative, secure and private storage applications to the non-blockchain and cryptocurrency-based world for both consumers and companies around the globe.

KnoxFS utilizes existing third-party opensource storage networks, which enables scalability, flexibility, and redundancy. The project was founded late 2017 and was named Aegeus. The initial goal was to develop a decentralized storage network based on IPFS technology. Aegeus rebranded to KnoxFS in 2020 and made a pivot later that year. A new team and leadership switched focus to create storage applications for third party networks. This change of strategy enabled KnoxFS to speed up development and shorten the time to market, while at the same time expanding the potential userbase and actively pursue strategic partnerships.

Our long-term goal of KnoxFS is to offer a range of applications ('products') that are commercially viable, all centered around decentralized storage with a broad userbase. Additionally, the self-developed software solutions will have the KFX currency as a payment option and therefore drive demand for the coin.



Organization and Team Members

KnoxFS is a so called Decentralized Autonomous Organization (DAO). This means that the project is not linked to a business corporation, or any legal entity, nor to a certain country or state. The organization consists of a group of team members who work on a voluntary basis and community members that are often also investors in the project, meaning that they have bought KFX coins. Because KnoxFS is not a company, it also does not have a CEO or any other directors. Team members choose to support the KnoxFS project on a voluntary basis and are not paid for their participation. All members of the team have a role that fits their personal interest and skill set. As the project evolves, we aim to expand the team and introduce more governance. Introducing paid roles will be looked at once the funding permits this.

Current team members:

Robin Kuipers (The Netherlands) – Project Lead

Laurent Fanise (France) – Development Manager

Quoc Pham (United States) – Community Manager

Matthias Joram (Germany) – Community Manager

Yasman Montilla (Venezuela) – Community Manager

Nicolas Meienberger (Switzerland) - Developer

Luis Leon (Mexico) – Developer

Ethan Snajder (France) Developer

And others.

Decentralized Storage

Decentralization is understood as the transfer of authority from a central entity to a more localised and 'liberal' system¹. Storage is defined as the retention of retrievable data on a computer or other electronic system. We use storage on a daily basis from our mobile phones and computers and it is easily understood from the files we put onto a USB stick. From the days of having to put files on a floppy disk to being able to place files in the 'cloud', storage has come a long way.

Current well known and widely used solutions of for instance Google Drive and Dropbox still work great and they seem to have a huge market share. However there have been growing concerns as to why users want to switch from these systems due to the restrictive nature of some services as well as the more commonly understood reports of recent company data leaks and privacy issues. An ever-growing group of people do not trust their data and their privacy to be carefully handled by big tech corps such as Facebook, Google and Apple. Big companies make money on customer data, and often violate the privacy of their users. And in some countries, it can even be very risky to trust data to commercial companies, especially in regard to politically sensitive data.

It's therefor no surprise that decentralized storage is becoming very popular and the infrastructures are ready to be utilized. But many of these infrastructures are still quite new and not fully adopted because of a lack of use cases. In other words: the decentralized storage networks are ready to be used, but there are not that many products available yet. And this is what KnoxFS wants to change! We expect a growing demand for decentralized storage applications,

the infrastructure is ready, and we will build the tools to utilize these networks. The major players in this market, based on Market Capitalization², are Filecoin, Sia, Storj, BitTorrent and Pac Global. Although these projects use different protocols and technology, what they have in common, is that they are either sharing unused data, or incentivizing users or storage providers, to share their storage resources (ie. disk space). These storage providers are rewarded in the native coin (Sia, Storj, FIL, etc). People that want to use these resources, also called 'renters', will have to pay for the resources.

The unique feature of KnoxFS products, is that they will offer people the possibility to use storage resources on multiple networks, without having to own all these different coins as a payment.



¹Source : <https://medium.com/bitfwd/what-is-decentralised-storage-ipfs-filecoin-sia-storj-swarm-5509e476995f>

²Source: <https://coinmarketcap.com/view/storage/>

Product / Applications

The best description for KnoxFS is a software developer supported by blockchain technology. We develop software applications during the crypto trend utilizing a cryptocurrency. Our core business is developing software solutions based on decentralized storage. As described in the previous chapter, there is a growing demand for secure ways to store private data without having to trust this data in the hands of big tech corporations (centralized). It is KnoxFS' ambition to offer a broad range of different decentralized storage solutions to various customers. The first product that we will release in 2021, is a general file storage application comparable to Dropbox, Google Drive, or Onedrive. We will release this application as a web-based app but also for Windows, MacOS, Android, and iOS. The essential difference between the KnoxFS storage app and well-known apps such as Dropbox, is that files will be stored on decentralized third-party storage networks. Completely safe, secure, and private!

The first beta version will exclusively offer storage on the Sia network (see previous chapter). However, the unique selling point of our storage app will be the possibility to choose between multiple networks, for example Sia, Storj, and Filecoin. Users can decide to store their files on more than one network for extra redundancy. This is what we call a hybrid storage solution. Upon release, the KnoxFS app will be marketed as a consumer app, with a large potential userbase. A *'freemium'* subscription model will be used, offering a free to use app (with limitations and/or in-app advertisements) and a premium subscription with extra features and without advertisements. By offering a free version, we want to grow a large userbase in a relative short period of time. The premium version will have KFX as a primary currency for payment. If additional payment options are made possible (most likely Bitcoin and Fiat Currency), then users that pay with KFX will be discounted. By giving an incentive to pay with KFX, we want to promote KFX and drive demand for our native coin.

One of the premium features that will be included in the first version, is the ability to store meta data on the KFX blockchain. The meta data can describe characteristics of a certain file that is stored in the application. A user can, for instance, add his/her name, file type (public/protected), target network (Sia, Storj, File), recipient, date stamp or other information to the upload. Because this data will then be stored on the blockchain, it will always be verifiable via the blockchain explorer and could work as a 'proof of storage'. This could be interesting for legal reasons or to 'certify' a file upload, because the added meta data can be permanently stored on the KnoxFS blockchain and will never be editable again.

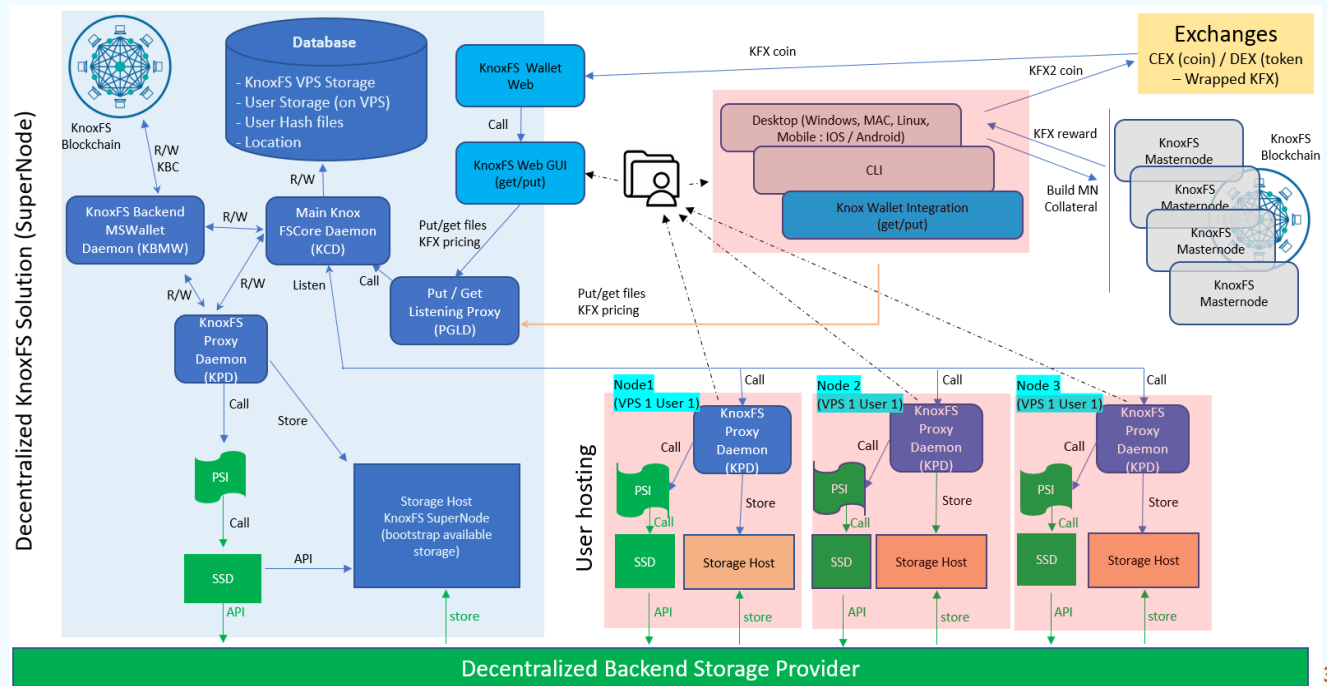
Architecture

We will give the public (individuals and businesses) simple and inexpensive access to storage space currently unused on servers around the world.

KnoxFS will not redevelop a new decentralized storage infrastructure backend. These infrastructures already exist or are under development such as IPFS, Filecoin, Sia / Skynet, Pac Global, Storj ...

Most of these projects are open-source and can therefore be used and integrated into the KnoxFS solution.

The technical architecture proposed to meet this objective is visualized in this schematic.



³ See last page for enlarged image.

Name and description of the components used in the solution:

- **DSS** : Decentralized Storage System
- **KBC** : KnoxFS Blockchain
- **DKS** : Decentralized KnoxFS Solution (KnoxFS SuperNode)
- **DSBS** : Decentralized Storage Backend Solution (IPFS, Sia/Skynet, Storj, Pac ...)
- **PSI** : Provider Storage Interface (Webservice, Rest API, CLI, ...)
- **SSD** : Specific Storage Daemon (APIs provided by storage backend solutions)
- **KPD** : KnoxFS Proxy Daemon
- **KCD** : KnoxFS Core Daemon

- LGLD : PutGet Listening Proxy
- KBMW : KnoxFS Blockchain Microservice Wallet

Meaning of component color:

- **Green** : Decentralized Storage Backend Network (client-side / server-side)
- **Dark blue** : Backend components
- **Light blue** : Frontend components
- **Red** : Client-side

To ensure 100% decentralized operation, the master data will not necessarily all be in the database but entered directly into the KnoxFS on-chain Blockchain and accessible by the components of the SuperNode. To function optimally a SuperNode will therefore need a functional copy of the KnoxFS Blockchain (KBC).

A Supernode is totally different from a regular Masternode, as described in the chapter '*Masternodes and staking*'. A Supernode contains all the operating components of the product (a database, web server, storage access components, local storage, APIs, etc). The more Supernodes there are, the more decentralized the solution will be. A Masternode on the other hand, only executes the KFX blockchain.

Backend Storage

KnoxFS technology will be based on a decentralized storage system (DSS).

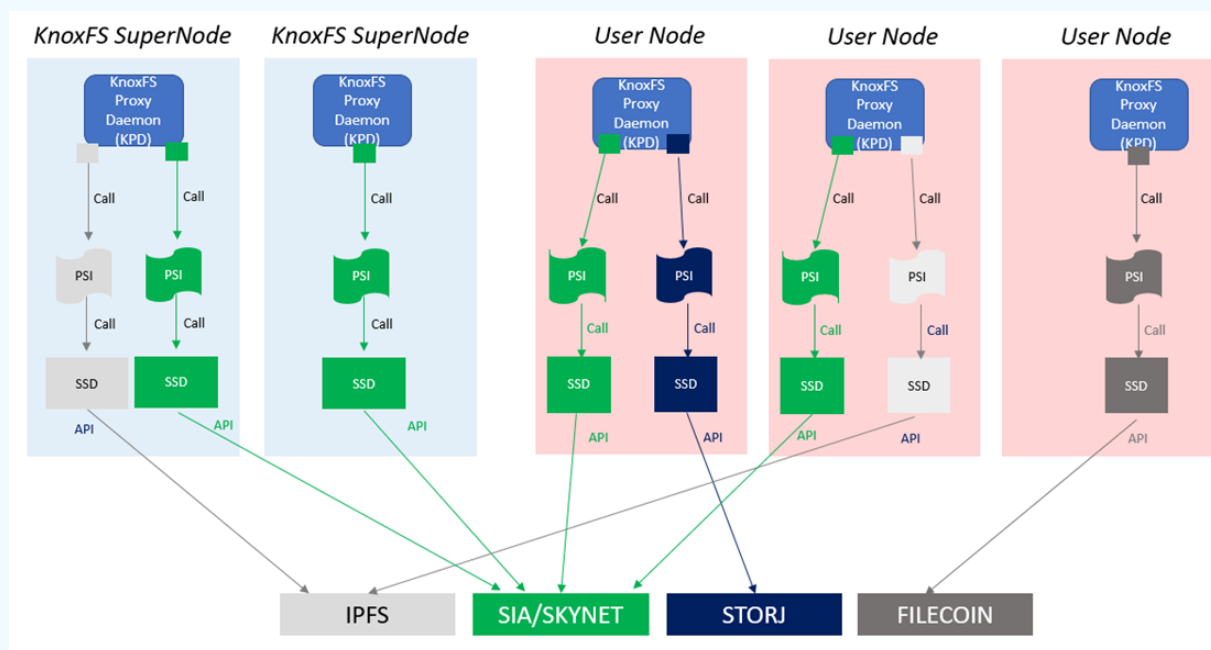
As in so many areas, blockchain technology has the potential to fundamentally disrupt this entire storage industry by relying on new paradigms.

In recent years, many projects around these new ways of storing documents have been developed but as of today, none of these solutions offer easy access usable by users without technical knowledge.

KnoxFS will therefore rely on a hybrid distributed technology based on Software Defined Networking (SDN) and a Peer-to-Peer (P2P) network, while remaining agnostic to the underlying storage infrastructures (DSBS).

This non-dependence on a single backend solution will be ensured by the KPD component which must be modular enough to interface via plugins to the various suppliers (PSI and SSD).

If necessary, SuperNodes or Nodes can use n plugin (s) / module (s) to have the possibility to access several DSBS.

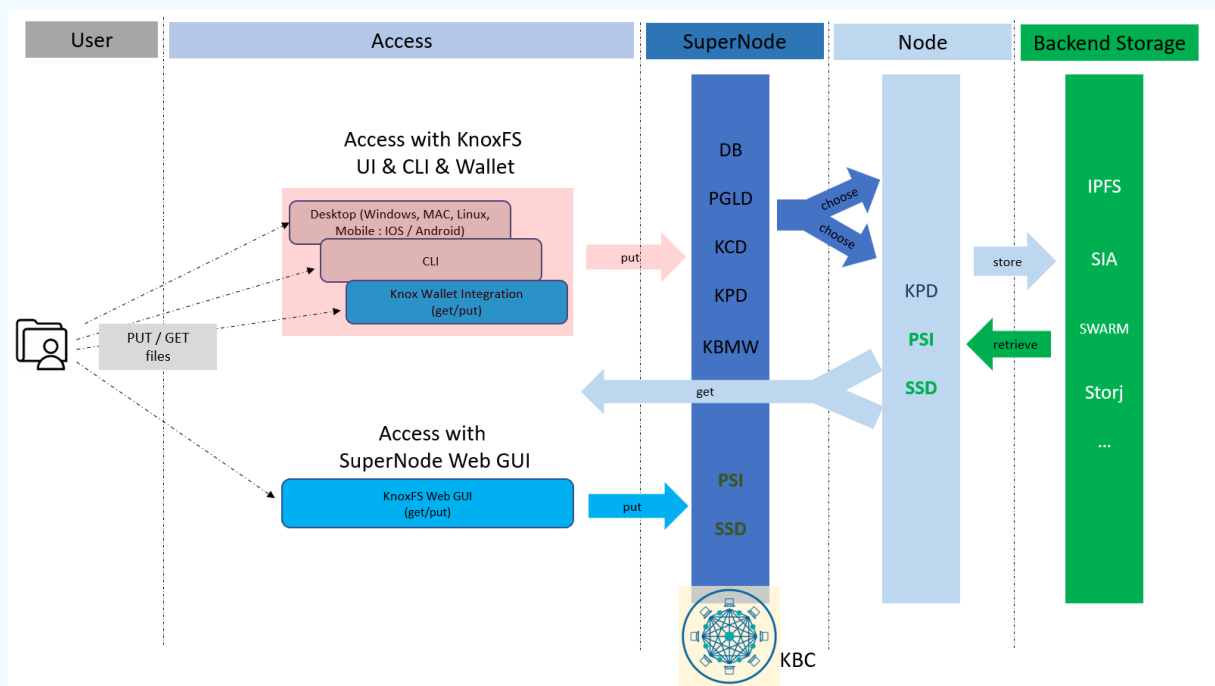


Storage Workflow

End users should be able to back up and restore files simply by using "classic" tools

What we will develop to access decentralized storage:

- Windows, MAC and Linux applications
- IOS / Android mobile applications
- Use in multi-OS CLI (Command Line Interface) mode
- An access tab integrated into the KnoxFS Wallet
- A Web interface hosted on a SuperNode (KnoxFS Web GUI)



These components will interact with the KnoxFS SuperNodes through the PGLD component for sending and storing files, and the KPD component for data retrieval.

The PGLD component will send the data to the KCD component which will be the operating engine of the SuperNode. The KCD component manages the storage of user file metadata in the database, and more importantly is in charge of finding the right nodes to store user files.

The "vital" metadata of the files will also be stored in KBC (Blockchain KnoxFS)

In order to reduce file write latency, the SuperNode can be used as a cache to take the time to find the most appropriate nodes according to the contract requested and paid for in KFX by the user (this can be the replication rate, a desired geographical position of the files, have a recovery speed....).

It is possible that no node meets the criteria of the contract. In this case, the KnoxFS SuperNode will back up the user files while waiting for one or more nodes to meet the required criteria in order to store the data there.

If no node is available on the network, a request mechanism with more advantageous rewards will be offered to all existing or future nodes to quickly respond to storage contracts requested by users.

As soon as the KCD component identifies the nodes eligible for the storage of user files, it will communicate the data and metadata to the KPDs of the nodes which will communicate thanks to the PSI and SSD components of the Storage Backend used by the nodes.

For storing files from the same user on several nodes, the same DSBS will be preferred to avoid using storage solutions that are too heterogeneous and complicate the technical solution.

For a global and secure operation, the SuperNodes will also have to synchronize among themselves the metadata contained in the DBs in Active Active mode with a re-election system in the event of failure of a master Supernode.

File metadata, contracts and negotiations between users and renters will also be stored in the KBC (KnoxFS blockchain).

Ecosystem of an autonomous system

The entire solution must ultimately be autonomous and operate in a fully distributed mode.

The SuperNodes provide the gateway to the KnoxFS network and the nodes known to the SuperNodes will store user data.

Users must for each file or file tree, define a storage contract for their data with at least:

- replication rate (1, 2 ... n)
- storage time (1h, 1d, 1m, 1y,... Unlimited)
- reserved volume
- file location
- speed of access to storage spaces
- ...

A contract for the use of storage spaces made available on the nodes by rental companies must also be defined with at least:

- The space available on their node
- The minimum guaranteed access speed
- The cost of Go / To
- SLA proposed by the node
- ...

This information must be known to SuperNodes (KCD and DB components) to match the rental contracts with the storage contract requested by the users.

A loss mechanism must be put in place in the event of a contract not respected by a renter.

A final point to be resolved is that of the DSBS which will use their own tokens (SiaCoin for Skynet, FIL for FileCoin...) for data storage.

In order to be agnostic to backend storage infrastructures, KnoxFS must also be able to manage pairs of storage tokens to make live exchanges at market price and match the cost of storage paid by the user and the remuneration of the lessor in token of the backend used.

To be able to handle these pairs, the SuperNodes will have to integrate the complete blockchains of the DSBS solutions implemented.

We can also aim for strong partnerships with the main decentralized storage solutions on the market. If possible, these partnerships should allow for KFX to be natively integrated into these solutions.

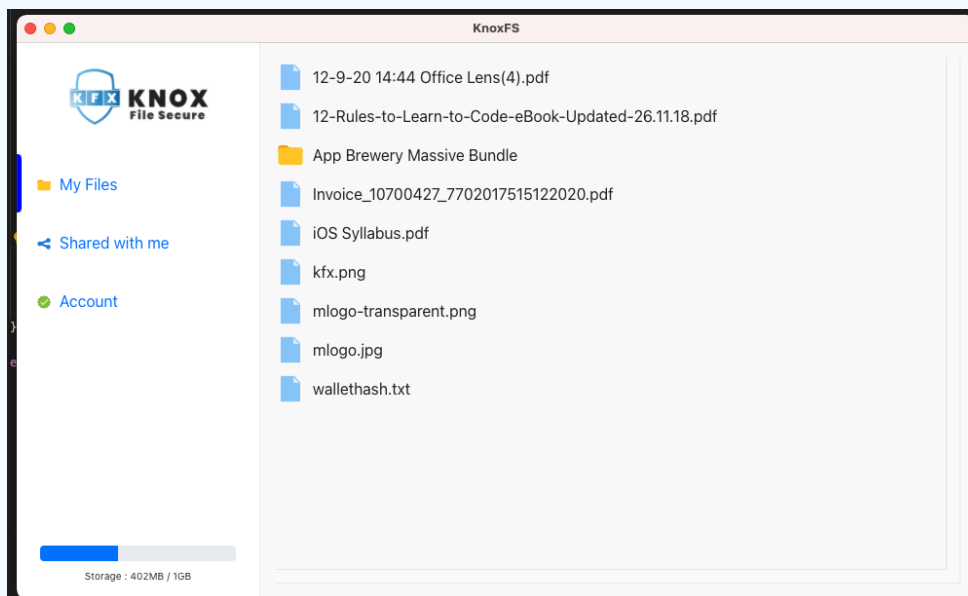
If this were the case, the number of components to be developed would be considerably reduced and optimized.

The main pairs that will need to be implemented and handled by the KCD and KPD components will be as follows:

Storage Back-end	Coin/Token	Pair
Sia/Skynet	SC	SC / KFX2
Filecoin	FIL	FIL / KFX2
Storj/Tardigrade	STORJ	STORJ/KFX2
IPFS	No coin	No coin

We envision that these exchanges or swaps will operate in a similar way as liquidity pools on DeFi platforms, with a wrapped version of the KFX coin (wKFX) on the Ethereum or on the Binance Smart Chain network.

We will create on these decentralized exchanges (DEX) pairs between the KFX token and other storage tokens to provide liquidity and facilitate payment for the use of the multiple storage offers available on the market.



This year, 2021, our primary focus will be to develop a file storage application as described above. But there are many other potential products that could be added to our portfolio in the near future.

For instance a backup tool for widely used NAS hardware from Synology or Qnap, a tool to sync photos from your mobile phone, or a webhosting solution for audio and video files.

By the end of the year, we will invite our community to give their input on which product we should develop next. In any way, KnoxFS should always involve decentralized storage, be commercially viable, and drive demand for KFX.

Funding and Revenue

At KnoxFS, we tend to approach the project as if it were a regular company. To succeed, we need to generate income to cover operational expenses and project development. For everything we develop at KnoxFS, we keep the use case in mind. All our products should have the potential to be commercially viable and drive demand for KFX. Therefore, we have explored the following revenue streams for our application:

In-app advertisements:

To offer a free version of our file storage application to consumers, we need to find a way to cover the costs of storage resources. We want to do this by including advertisements (banners) within the application.

Premium subscriptions:

To unlock premium features and more storage capacity, we will charge subscription fees for premium plans.

Coin sales:

KnoxFS is generating development funds via the automated block reward. On average around 3000 KFX per month is generated as development fund. These coins can be used for payments, but also sold for BTC on one of the exchanges where KnoxFS is listed. Additionally, the team offers coinpacks on Vault.Investments. Investors can buy fixed number of coins directly from the team as an OTC trade.

Grants and sponsorships

Third party storage networks are an essential part of the KnoxFS storage solutions. Partnerships with these parties will prove to be very vital to our success. This works both ways, because these storage network providers rely on third party app developers to utilize their networks. For this reason, some of these network providers offer grants and financial sponsorships to app developers who create apps for their storage network. The team will try to benefit from the partnership opportunities that are available.

Masternodes and Staking

The KnoxFS blockchain uses a Proof of Stake (PoS) algorithm and supports staking and masternodes.

Masternodes are nodes running the same wallet software on the same blockchain to provide extra services to the network. These services include coin mixing for increased privacy of transactions, instant transactions, and decentralized governance that provides a decentralized budgeting system with an immutable proposal and voting system³.

For providing such services, holders/owners are also paid a certain portion of reward (in KFX) for each block.

This can serve as passive income to the masternode owners minus their operating costs. The KnoxFS

Masternodes are incentivised nodes that receive rewards based on their availability and their ability to offer network services in a decentralized and trustworthy manner.

Running a KnoxFS Masternode requires locking a certain amount of KFX for as long as you choose to run the Masternode. Masternode owners will be allowed to vote on budget and development proposals in the future.

Masternode and Staking Rewards

A collateral of 1000 KFX is required to operate a KFX Masternode. A minimum of 50 KFX is required to enable staking. Every two minutes a new block is created on the blockchain and a reward is distributed to masternodes and stakers; 79% of the block reward is distributed amongst masternodes and only 1% of the reward goes to stakers. The remaining 20% of the block reward goes into a development fund. This makes running a masternode more profitable than staking coins. As the block reward is gradually being reduced, the return on investment (ROI) is also being reduced, resulting in a lower coin inflation. The relative high ROI at the start of the project, is beneficial for early investors. But as the project matures, the creation of new coins (ie. the inflation) is reduced to limit the circulating supply and support the value of the coin.

³ Will require upgrade of wallet codebase, which is included in our roadmap.

KFX - Coin Specifications

Listed below is an overview of coin specifications and blockchain characteristics that are relevant for masternodes and staking.

Coin name: **KnoxFS**

Ticker: **KFX**

Algorithm: **PoS**

Block Reward: **Variable (Table Below)**

Masternode Collateral: **1000**

Masternode Reward: **79%**

Staking (POS) Reward: **1 %**

Development Fund: **20 %**

Block Time: **2 min**

Minimum Staking Age: **12 hours**

Minimum Staking Amount: **> 50 KFX Coins**

Coin Maturity: **61 Confirmations**

Maximum Supply: **5 000 000 KFX**

Pre-mine 350,000 KFX (used to facilitate swap old KFX to new chain in 2020)



KFX (v2) Rewards Distribution							
		Block time	2 min			Premine	350 000
		Blocks/week	5040			Max supply	5 000 001

Phase	Weeks	From block	To block	Block reward	MN	Dev	Stake
1	12	201	60000	0,45	0,3555	0,0900	0,0045
2	12	60001	120000	0,47	0,3713	0,0940	0,0047
3	12	120001	180000	0,48	0,3792	0,0960	0,0048
4	12	180001	240000	0,51	0,4029	0,1020	0,0051
5	12	240001	300000	0,53	0,4187	0,1060	0,0053
6	12	300001	360000	0,57	0,4503	0,1140	0,0057
7	12	360001	420000	0,59	0,4661	0,1180	0,0059
8	12	420001	480000	0,63	0,4977	0,1260	0,0063
9	12	480001	540000	0,66	0,5214	0,1320	0,0066
10	12	540001	600000	0,69	0,5467	0,1384	0,0069
11	12	600001	660000	0,72	0,5720	0,1448	0,0072
12	12	660001	720000	0,76	0,5972	0,1512	0,0076
13	12	720001	780000	0,79	0,6225	0,1576	0,0079
14	12	780001	840000	0,82	0,6478	0,1640	0,0082
15	12	840001	900000	0,85	0,6731	0,1704	0,0085
16	12	900001	960000	0,88	0,6984	0,1768	0,0088
17	12	960001	1020000	0,92	0,7236	0,1832	0,0092
18	12	1020001	1080000	0,95	0,7489	0,1896	0,0095
19	12	1080001	1140000	0,98	0,7742	0,1960	0,0098
20	12	1140001	1200000	1,01	0,7995	0,2024	0,0101
21	12	1200001	1260000	1,04	0,8248	0,2088	0,0104
22	12	1260001	1320000	1,08	0,8500	0,2152	0,0108
23	12	1320001	1380000	1,11	0,8753	0,2216	0,0111
24	12	1380001	1440000	1,14	0,9006	0,2280	0,0114
25	12	1440001	1500000	1,17	0,9259	0,2344	0,0117
26	12	1500001	1560000	1,20	0,9512	0,2408	0,0120
27	12	1560001	1620000	1,24	0,9764	0,2472	0,0124
28	12	1620001	1680000	1,27	1,0017	0,2536	0,0127
29	12	1680001	1740000	1,30	1,0270	0,2600	0,0130
30	419	1740001	3847678	1,50	1,1850	0,3000	0,0150

Blocks / phase	Coins / phase
59799	26910
59999	28200
59999	28800
59999	30599
59999	31799
59999	34199
59999	35399
59999	37799
59999	39599
59999	41519
59999	43439
59999	45359
59999	47279
59999	49199
59999	51119
59999	53039
59999	54959
59999	56879
59999	58799
59999	60719
59999	62639
59999	64559
59999	66479
59999	68399
59999	70319
59999	72239
59999	74159
59999	76079
59999	77999
2107677	3161516

MNs	ROI (%)
230	40
256	36
285	33
313	31
344	30
376	29
410	28
445	27
483	26
523	26
564	25
608	24
653	24
700	23
750	22
801	22
854	21
909	20
966	20
1024	19
1085	19
1148	18
1212	18
1279	18
1347	17
1418	17
1490	16
1564	16
1640	16
1718	15
4880	6

Exchanges

Although KnoxFS was initially founded in 2017, it was re-started late 2020 and therefore we are a typical startup. There are approximately 300 early investors that are currently holding KFX. A vast majority of the coins they are holding (+/- 99%) are locked in shared masternodes until May 31, 2021. This was done so that the team can completely focus on technical development without having to worry about market pressure. As a result, there are very few coins (< 0,5%) for sale on the open market.

To this date, KFX is traded on two public exchanges, Crex24.com and Southxchange.com.

Southxchange.com was specifically chosen because of the fact that this exchange also listed Siacoin (SC).

Additionally, the team offers investors the possibility to buy KFX from the team (OTC purchase) on the platform of Vault.Investments.

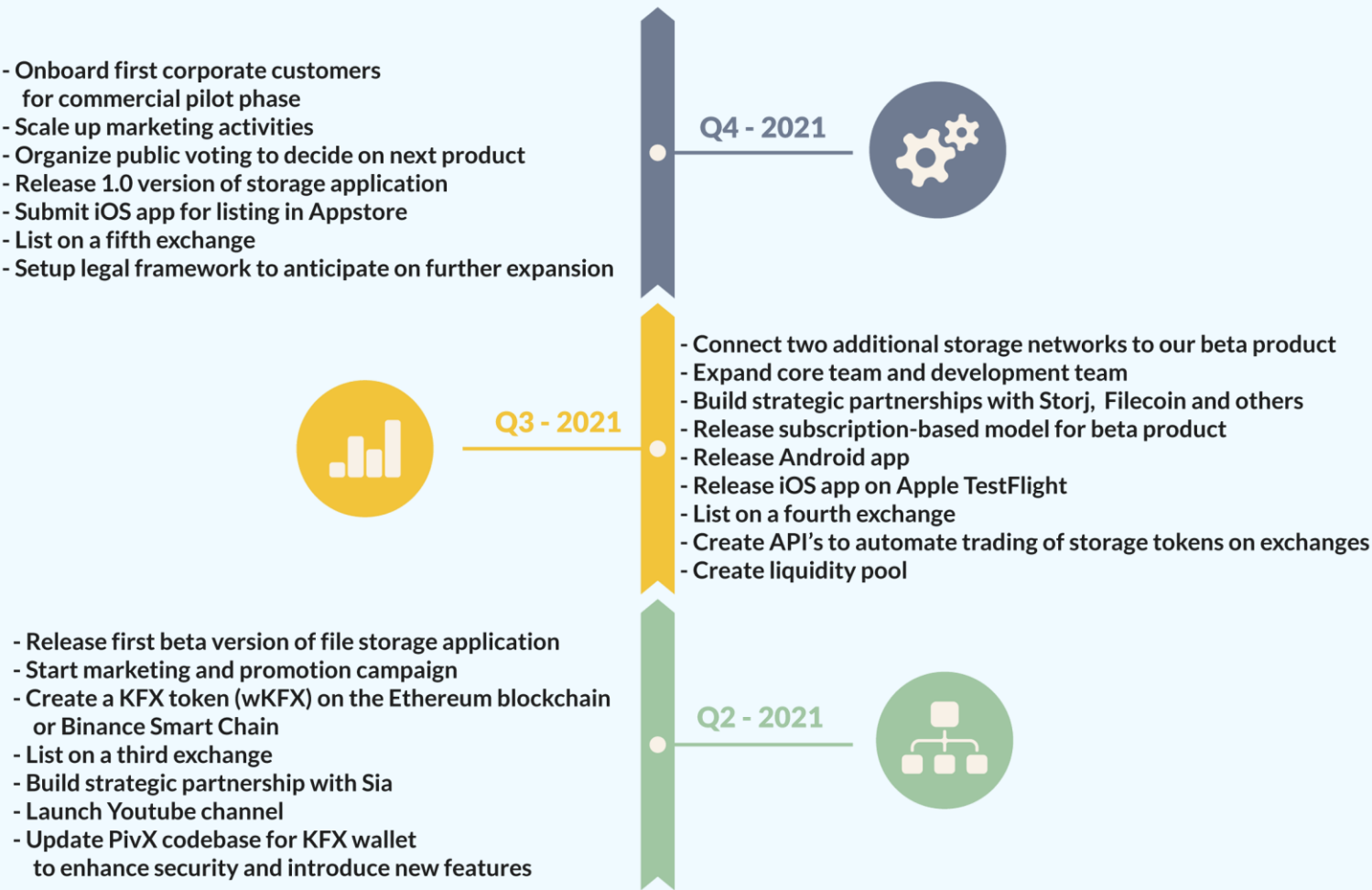
Vault.Investments has been an active partner for KnoxFS since late 2020. They have facilitated the swap to the current blockchain and are hosting the shared masternodes where most KFX are being held in until May 31, 2021. During this period, KFX holders are not paying a hosting fee for their masternodes. In return, Vault.Investments receives 50% of the development budget that is hardcoded in the block rewards. At the end of the lockup period, the agreement with Vault.Investments will come to an end. They will no longer receive half of the development budget, and KFX holders will start paying the regular fee to host their nodes on the platform.

As long as most coins are locked, the supply of KFX will be very limited as will be the trading volume and exchange liquidity. The two current exchanges will be sufficient for the upcoming months. However, once the lock-in period has passed, more trading is to be expected. We will add more exchange listings as we find suitable. When selecting a new exchange listing, we will look for an exchange that also listed Sia, Storj, Fil as well as offering a public API for automatic trading.

To create a solution for automatic swapping of coins, and to increase liquidity, we will be looking at bridging KFX to the Ethereum blockchain by means of creating a wrapped KFX token. An additional benefit is that this opens possibilities to trade on DeFi platforms and attract new investors.

Roadmap

At KnoxFS, we want to be fully transparent on what we are working on and how we are progressing. On Discord, we report frequently on accomplishments, technical milestones, and project updates. We understand that roadmaps are dynamic. For this reason, we maintain an online project dashboard on Trello to show the public an actual overview on where we stand with the project. Additionally, we push commits on Github to our Discord server, so that community members can follow progress on technical development. Without going into too much detail in this whitepaper, we want to offer a helicopter view on what can be expected from KnoxFS in 2021.



Contact Information

If you have questions about this whitepaper, or the project, please contact us via one of our social media channels. KnoxFS is always looking for new team members. If you like to participate in the project, please send one of the admins a DM.

Discord (primary communication channel):	<u>https://discord.gg/bTtgmMf</u>
Telegram:	<u>https://t.me/knoxFSOfficial</u>
Twitter:	<u>https://twitter.com/OKnoxfs</u>
Github:	<u>https://github.com/KnoxFS</u>
Trello:	<u>https://trello.com/b/od2b0mGW/knox-fs-roadmap</u>
Email:	<u>contact@knoxfs.com</u>
Exchanges:	<u>https://crex24.com/exchange/KFX-BTC</u> <u>https://main.southxchange.com/Market/Book/KFX/BTC</u>
OTC investment:	<u>https://my.vault.investments/coins/kfx/coin-packs/</u>

Decentralized KnoxFS Solution (SuperNode)

