



# Splinter

Technical vision  
**Splinter**

Version 1.0

# Document structure

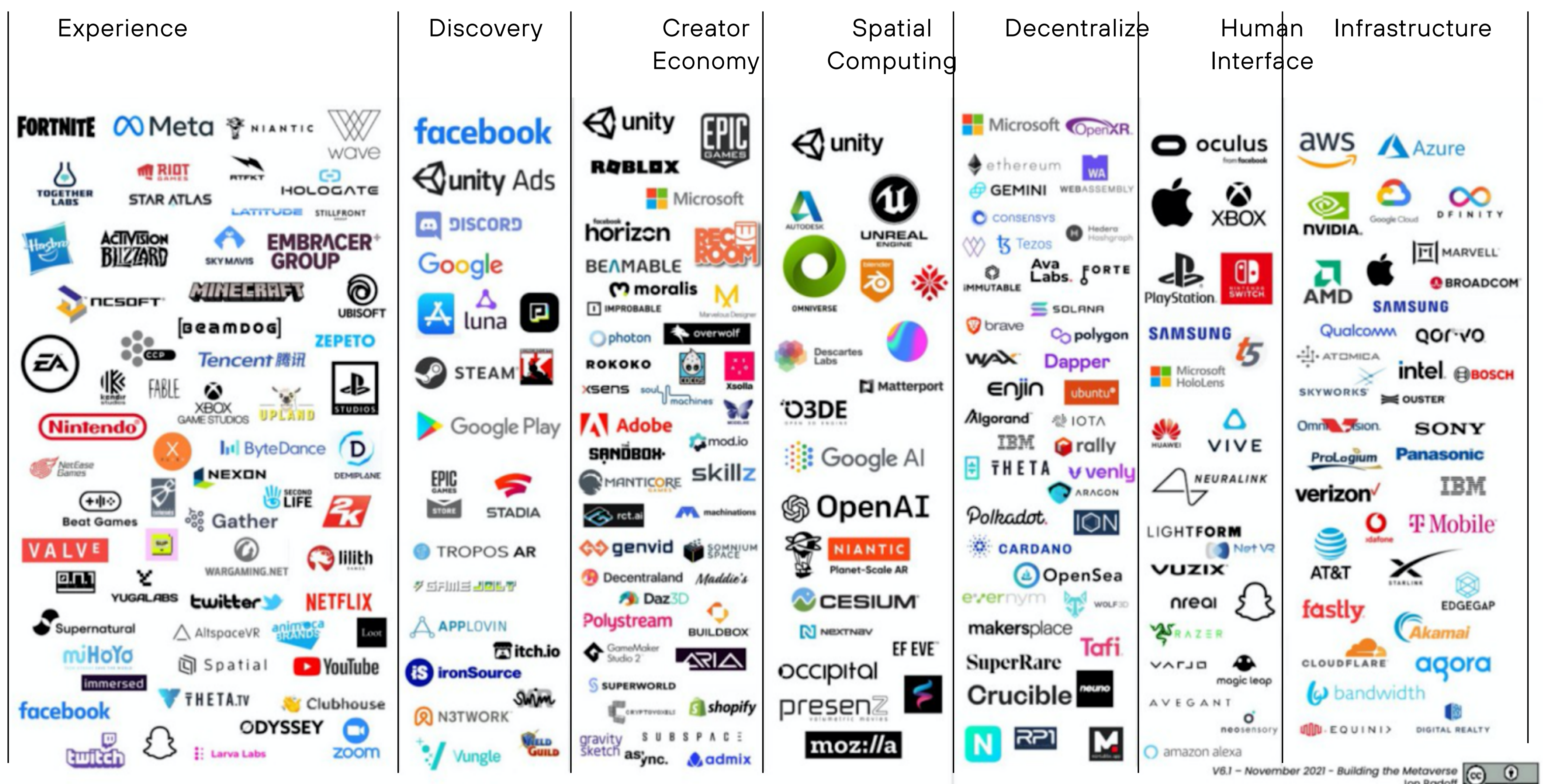
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# Introduction

Relationships within society throughout its existence are the engine of technological progress. This relationship brings the efficiency of the daily processes of mankind to new levels of opportunity and freedom. This is not a radically new phenomenon; most often, it is the use of modern technological capabilities for understandable and well-established needs. AR/VR technologies, decentralized ledgers, cryptocurrencies, and everyday activities formed the Metaverse concept. Although the technological aspect of the Metaverse concept is still in the active stage of formation, it is clear that this is much more than just the gamification of the pastime - it is an opportunity for learning, earning, and cultural enrichment - all of which our real-life is made of.

The Metaverse is a transition of yesterday's tasks and needs into tomorrow's virtual possibilities. At the same time, it is essential to note the opportunities in which the fundamental value is a virtual asset that the user owns uncompromisingly without any intermediaries or conditional property rights. This is the first and main technological challenge in a newly formed industry. It acquires such importance and relevance in the context of the technological restructuring of approaches from WEB 2.0 to WEB 3.0, which increases the expectations of the technology community.







## Market Demand

Many metaverse projects have already been announced, and many more will appear in the future. The industry's potential is estimated at trillions of dollars over the next 10 years. In 2024, according to forecasts, **the Metaverse industry will reach 800B USD with a 40% CAGR**. At the same time, Metaverse also acts as a catalyst for other industries, such as the gaming industry, almost doubling its revenue to **\$413B**. The concept of metaverse impacts high-end fashion houses, which are moving their products into the virtual world, and even corporate giants such as Coca-Cola are already conducting interviews

through a metaverse. With the onset of the global COVID-19 pandemic, conferences and summits have become increasingly virtual, which gives another push for the metaverse concept. New technological freedom generates demand for new services and entire infrastructures, which is what metaverse essentially is. At the same time, the accompanying processes of restructuring technological formats form the demand and the need to change the principles of data storage, assignment, and fixation of ownership rights and social opportunities.

## Splinter Solution

**The Splinter** project is a comprehensive solution built around social relationships, the need for asset tokenization and decentralized storage of metadata, and complete freedom in trading operations with tokenized assets. At the same time, **Splinter** is the first metaverse marketplace that allows users to fully immerse themselves in the virtual world and form a new level of interaction with the acquired NFT asset.

The project's main goal is to implement a complex ecosystem represented by a social network with access to the entire range of NFT asset

management, from creation to transfer of ownership. All data will be stored in a decentralized way using its own DFS(Decentralized File Storage) solution, the foundation of which will be users who will provide their disk space and be objective guarantors of decentralization. Creators and users will have access to the marketplace which will allow them to create and purchase NFTs and the metaverse - where users will be able to navigate in a large-scale virtual retail area, interact with NFTs and purchase them.

## Splinter Ecosystem

**Splinter is based on 4 pillars** - discussion, creation, trading, and storage. Own social network is a mechanism that allows gathering enthusiasts interested in NFT as a technology for fixing ownership rights. This is a way to discuss industry news and share relevant data.

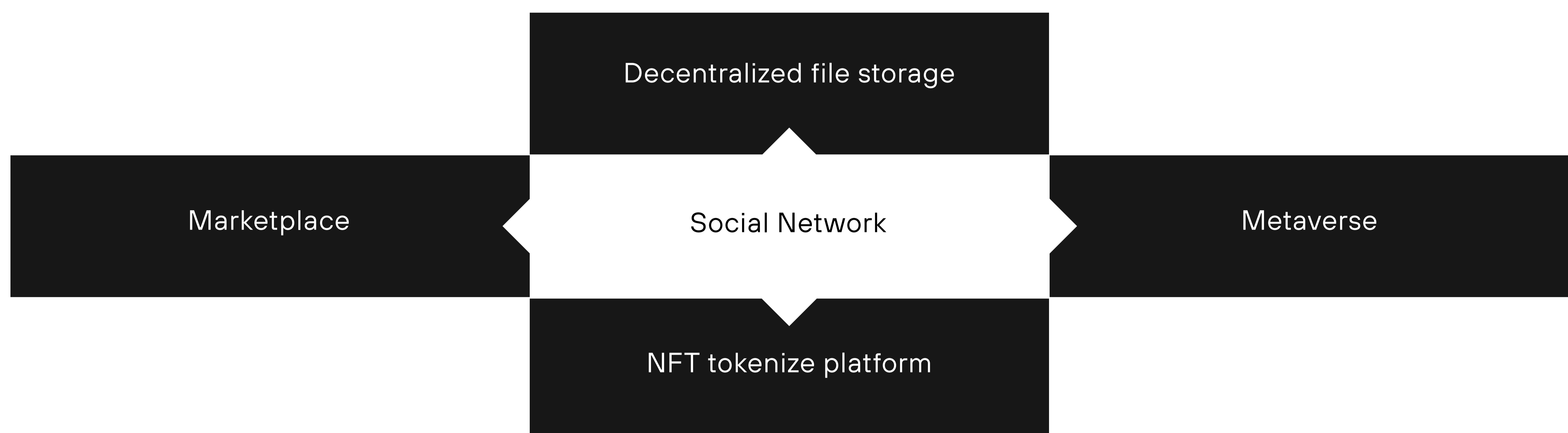
The main priority of the foundation is the information and the ability to deliver it quickly from user to user within the project



“

Splinter is a multifaceted project in functionality, but the social network element is fundamental.

### Splinter ecosystem structure



## Splinter Social Network

Each user has the opportunity to subscribe to the profile he is interested in, thus forming a circle of interests around him. Each user has a personal section with a news feed that displays the

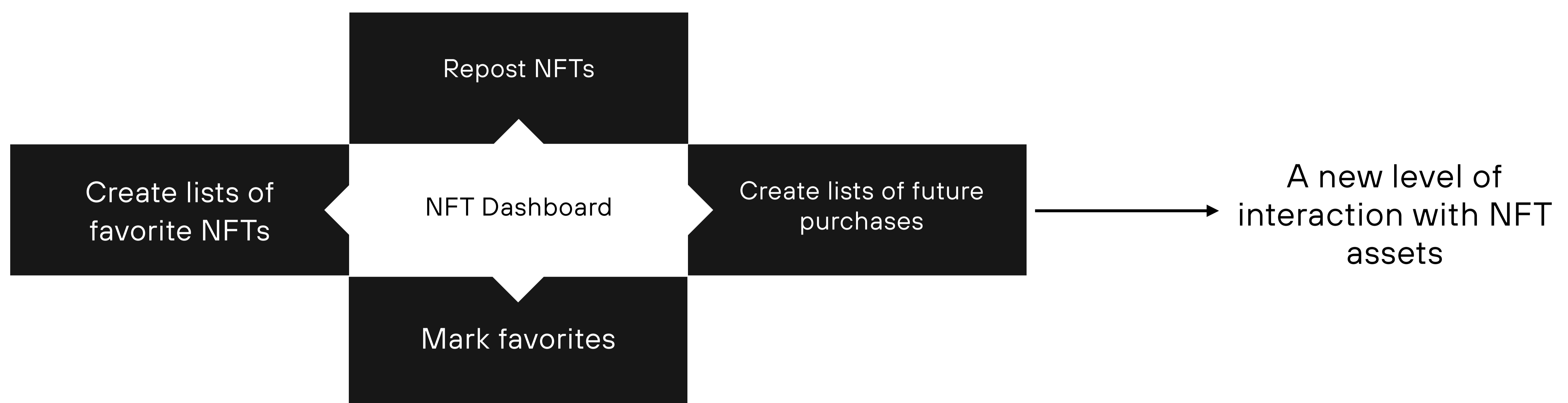
necessary analytics from external sources related to NFTs, their appearance, transactions, important events in the industry, feed from groups, and other targeted newsworthy events.



## Social Interaction

TSN is designed to provide access to a user-friendly NFT dashboard of the holder and/or investor with all aspects of social activities. This is a place where a user of the Splinter ecosystem can create lists of favorite NFTs, repost them,

mark favorites, and create lists of future purchases - all of that will simplify and bring the process of interacting with NFT assets to a new level.



Separate groups of users can form communities, both closed and open - on a paid and free basis. This is done on purpose to allow clustering of targeted discussions. Communication between users can be both private with personalized messages and open in public or custom message feeds.

The social network will be comprehensive and fully integrated with all product elements of the Splinter ecosystem to carry out complex management of a crypto asset within one platform - conveniently and quickly.

## Splinter Marketplace

This element of the project meets two fundamental criteria of Splinter as an ecosystem project - creation and purchase.

The main functionality available to the user is a simplified and understandable NFT coin minting scheme. This process has two options - releasing a single NFT and creating collections. The second option is designed to simplify the multiple launches of NFT assets. Within one process, user can issue several hundred NFTs while avoiding the high costs associated with this process.

The main functionality available to the user is a simplified and understandable NFT coin minting

scheme. This process has two options - releasing a single NFT and creating collections. The base standard for release is ERC721. According to the standard, identifiers are not a single unique asset but a class of assets. Compared to other standards, ERC721 is considered to be more efficient in terms of resource savings.

As a place for trading operations, the marketplace itself is represented by an understandable and clear structure. This will allow for quick and easy filtering of the lots by categories - gaming assets, art, sports, advertising platforms, etc.





## AI algorithm

A mechanism which will allow displaying lots of promising NFT artists in a separate section - based on the analytics of past events associated with a particular user. This process will be based on the number of NFTs issued by a given creator, the lowest price of a lot sold (all-time), the highest price, the growth rate, and the percentage ratio of the base price of all issued assets to the current one. This mechanism will allow people to decide on purchasing certain NFT assets in a simplified form.

## Fees

The commissions involved in transactions for the transfer of ownership of NFTs will have a simplified structure. Trade transactions will be subject to a **2% fee**, levying equally on the buyer and seller. The proceeds from fees will be used for developing and maintaining the Splinter ecosystem.

## Credit and Deposit System

A credit and deposit system for NFT assets will be the fundamental element of the marketplace. A financial AI/ML mechanism will be developed to allow depositing funds in various currencies to receive payments for the reporting period. The same funds will act as a lending source to NFT lot holders. The user will be able to automatically evaluate the asset he owns using the **Splinter** neural network and receive funds for temporary use. The **Splinter ecosystem** will act as a guarantor of the fulfillment of the conditions from all sides - Splinter will hold NFT as collateral for the return of funds and accrual of rewards in the future to the lender.

## System Implementation

The system will be implemented based on classical DAO approaches. It is designed to create ratings for various categories of lots, for which users of the **Splinter ecosystem will vote**. In addition, this mechanism will be designed to solve one of the most pressing problems in the industry, namely, centralized moderation. Thus, each user will be able to initiate (in case of detection of unethical lots) a vote to block a specific lot; thus the community will be the center for making strategic decisions.

## Payment processing

**The Splinter marketplace** is one of the first that will be able to fully support mutual settlements in fiat funds. A full-fledged mechanism of its own payment platform - **Splinter Payment Platform** - will be implemented to do this. It will provide versatile crypto-fiat, fiat-crypto operations, and direct purchase of NFT lots for fiat. This will simplify and bring to a new level of accessibility operations to acquire crypto assets. The decision to sell or purchase an NFT lot is fundamental within the marketplace.





## Video Streaming

The Splinter video streaming platform will be implemented within the marketplace to make the process of exploring NFTs more

interactive. It will allow users to watch cyber broadcasts of gaming assets, sports broadcasts of teams that place NFT ads, reviews of NFT art, and so on. In other words, this is the process of creating content support for each lot,

demonstrating its capabilities and features. Broadcasts can be watched both live and or as archived recordings.

The multifunctional base of the Splinter marketplace will unify all the needs of the community in one place, with convenient and accessible interfaces at the most optimal financial costs.

## Splinter Metaverse

**Splinter Metaverse** is an opportunity to interact with users in a new format - in detail, interactively, to convey targeted information flows. It will be represented by a separate space related to events and processes that directly connect with the NFT asset market.

The space will be represented by a large-scale virtual retail area - where permanent NFT sellers of the ecosystem will be able to get their virtual space and become a member of the Splinter vendor association. In other words, sellers will have a full-fledged store with showcases in which all of their lots will be presented. A hierarchy of retail space that will be available for purchase and

- **Educational** - it will be possible to organize lectures, seminars, and conferences to learn processes related to the world of cryptocurrencies and NFT.

This is done because **Splinter Metaverse** is a multifaceted element of the ecosystem designed to increase the target audience's interest in the

a temporary lease for association members will be implemented. The owners of virtual spaces will be able to customize the space according to the selected parameters, making the environment the most favorable for their target audience.

Potential buyers will be able to freely move around the Splinter world using a VR headset, view demo material that can be unique for each NFT. At the same time, some lots can be tested in games immediately after purchase if the corresponding asset is purchased.

**Splinter Metaverse** is additionally represented by three thematic areas:

- **Entertaining** - for virtual parties/discos
- **Cultural** - holding exhibitions of Nature, and other installations of modern digital art.

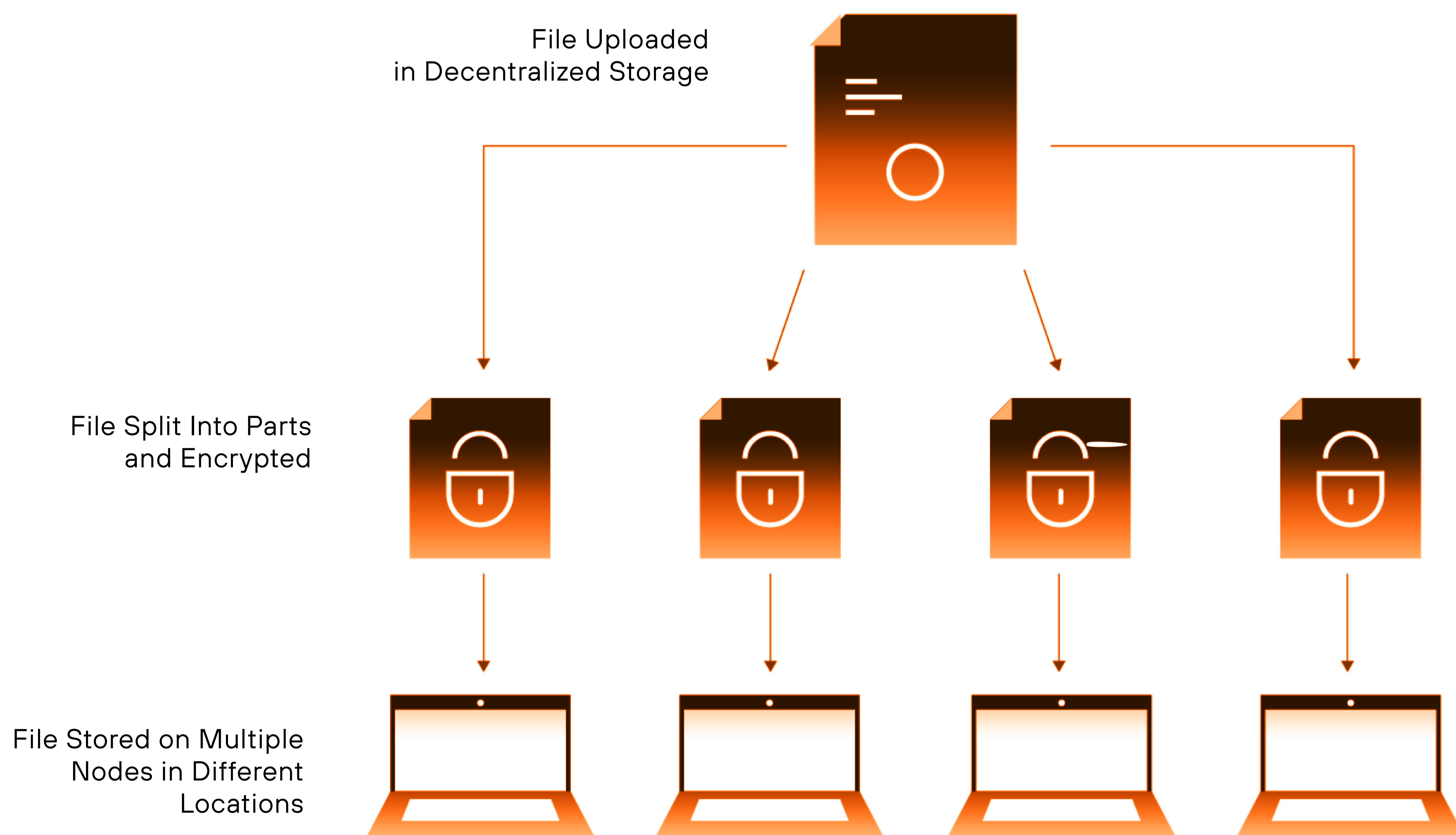
presented NFT lots and the world of rare crypto assets in general.



## Decentralized file storage

One of the important issues of the modern technological community is data storage, storage availability, security, and the cost of this service. Users are looking for providers that give access to storage and offer a highly secure storage environment. The emergence of metaverse projects creates additional particular importance to this topic today since the possibility of traditionally centralized storage of information is no longer a factor capable of meeting the needs of the industry.

In essence, **DFS Splinter is a two-sided platform that**, on the one hand, offers people to store their files securely and encrypted, segmenting them and distributing them among network members, and on the other hand, provides monetizing capabilities of users' devices through usage of their hard drive space. The system eliminates the possibility of attacking the network by sending spam with unwanted files. File segmentation is designed to maximize data availability and security.





## DFS functionality

In a simple file system such as FAT, file segments are scattered across the disk and there is a table responsible for collecting the segments in a sequentially ordered stream of bytes. The table contains the address of the segment on the disk, its size, and offset in the file. At the same time, it contains such entries for each file, directory, and other information that allows the representation of directory and file trees. Distributed File Storage (DFS) is similar to the above, but file segments (chunks) and file tables are stored in a peer-to-peer DFS network. When a user uploads a file to DFS, the DFS client sends a "Start File Upload" message to the closest node (we call it the front node). This message contains the file name, file attributes, preview icon, and so on. The front node creates a file index record (FIR). This entry contains all information about the file in DFS. In response, the host returns the assigned file ID. In this case, the DFS client generates a random file encryption key, and each file has a unique key.

The DFS client then segments the file into chunks (filechunk), encrypts each chunk with an encryption key, and uploads it to the front node along with the chunk ID, offset, and chunk size. The DFS client sends a "File download completed" message when the download is complete. The front node performs checks to make sure the information is complete and correct and tells the client whether the download was successful or not. The client encrypts the file encryption key with the user's public key and sends it to the front node to complete the file download.

After the front node begins to scatter pieces of files over the DFS network. Each fragment is stored on multiple nodes to ensure that a fragment can be retrieved at any time. The node addresses are stored in the FIR along with the block ID. When the scattering process is

complete, the FIR closes, and the host sends it to the DFS client for encryption. The DFS client encrypts the FIR and sends it back to the host along with the file key encrypted with the owner's public key. If all is well, then the node stores the encrypted FIR in a network database distributed over DFS.



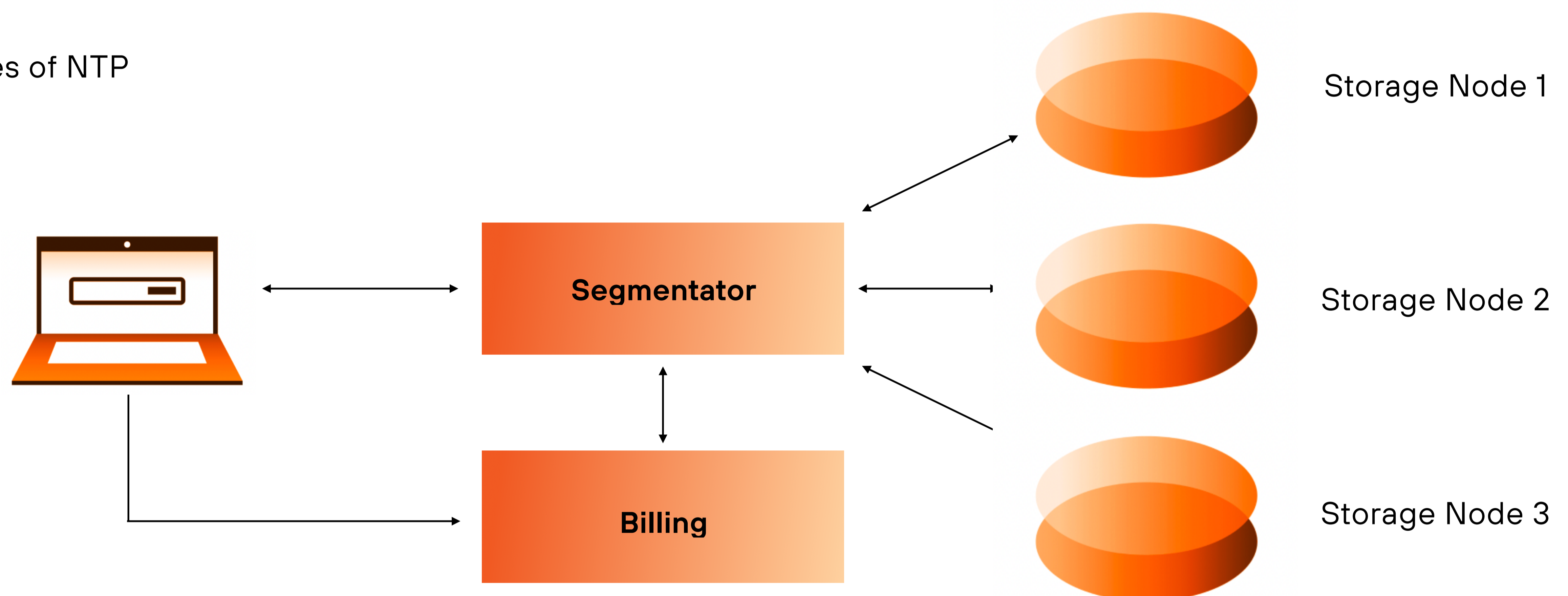
**Each fragment has a unique 256-bit identifier.**

Each fragment has a unique 256-bit identifier. When a chunk is stored on a node in a DFS network, that node does not know which file or user it belongs to. It's just an array of encrypted bytes. In other words, it's just a useless string from the point of view of any node user. No useful or meaningful information can be extracted from it.

Extracting information from chunks requires file assembly information (FIR) and a file key. But this information is also encrypted using the file's owner's public key and requires the owner's private key to decrypt it. But the owner's private key is stored only on the client's side and does not leave the client's device. Thus, the file is completely safe in DFS because no DFS host has the key to assemble the file and extract information from the encrypted fragments.



Main opportunities of NTP



## Additional element of storage security

An additional element of storage security can be the formation of a checksum of a file that is loaded into DFS. This value is written to the blockchain, along with the date and related information such as storage cost and duration.

Thus, if someone tries to commit illegal actions with the file, its checksum will not match the original entry in the blockchain. User nodes on which these manipulations were performed may be excluded from the network as unreliable.

## Client interface

Using the client interface, the client selects a file to download. Depending on the specified parameters, such as "storage reliability," which determines how many copies of the fragments will be created and stored on individual nodes, the client user interface calculates the cost of the operation and presents the final price to the client. If the Client accepts the transaction, information about this is sent to the Billing component, which debits the required amount

from the Client's balance and notifies the Segmenter about the start of the file download. The segmenter controls the distribution of file fragments (and their copies) across storage nodes. Downloading a file may have additional charges, so the process also goes through the Billing component. The download will not start until the segmenter receives payment confirmation from the billing component.

## NFT tokenize platform

NFT tokenize platform (NTP) is a platform that will allow new metaverse providers and creators of PTE games to simplify the process of asset tokenization, thereby forming an ecosystem of external projects around Splinter. This will allow creating, adding, and deleting objects and subsequently ensuring their transfer between games and metaverse spaces. The platform will

use specific templates that will be the source of data and usage rules for each game object. Each NFT token will be tied to a template that will imply a specific game item or character, its certain standards, and parameters so that game objects have the same properties, visual components, etc.



## The main tasks of NTP:

- Implementing a mechanism for interacting with the tokenization process so that game studios can independently release NFTs and then use them in their games, virtual spaces.
- Implementing a seamless mechanism for transferring and using objects between games running in the **Splinter** ecosystem and directly in the **Splinter** metaverse itself.

### Creation of templates

One of the fundamental processes of the platform is the creation of templates that are assigned to each in-game item. Once the templates are

assigned to the objects, the creation of the NFT is triggered.

Below is an example of a completed template:

## Template in DB store game ecosystem:

ID	3456798525	
Name	Template 1	
Template Policy	1. Unchangeable	E
	2. For the Same Theme	REL
	3. For All	REL

Author ID	3456798525
DS of the Author (Digital Signature)	

### Variable Part

Parameters			Policies of the Parameter						
Title	Blockchain Wallet	Link to the Set of Resources in DB	Unchangeable	For the Same Theme	For All	Editor's ID	Editor's DS	Coefficient of Game 1	Coefficient of Game 2
1. Health	1324656487					1324656487		1	0.1
2. Attack	1234679845					1234679845		2	0.5
3. Defense	4631659782	5487632154	E	RE	RE	4631659782		10	0.001
...	...					...			
						Editor's ID	254789652	658997427	
						Editor's DS	DS Coefficient	DS Coefficient	
							1	2	

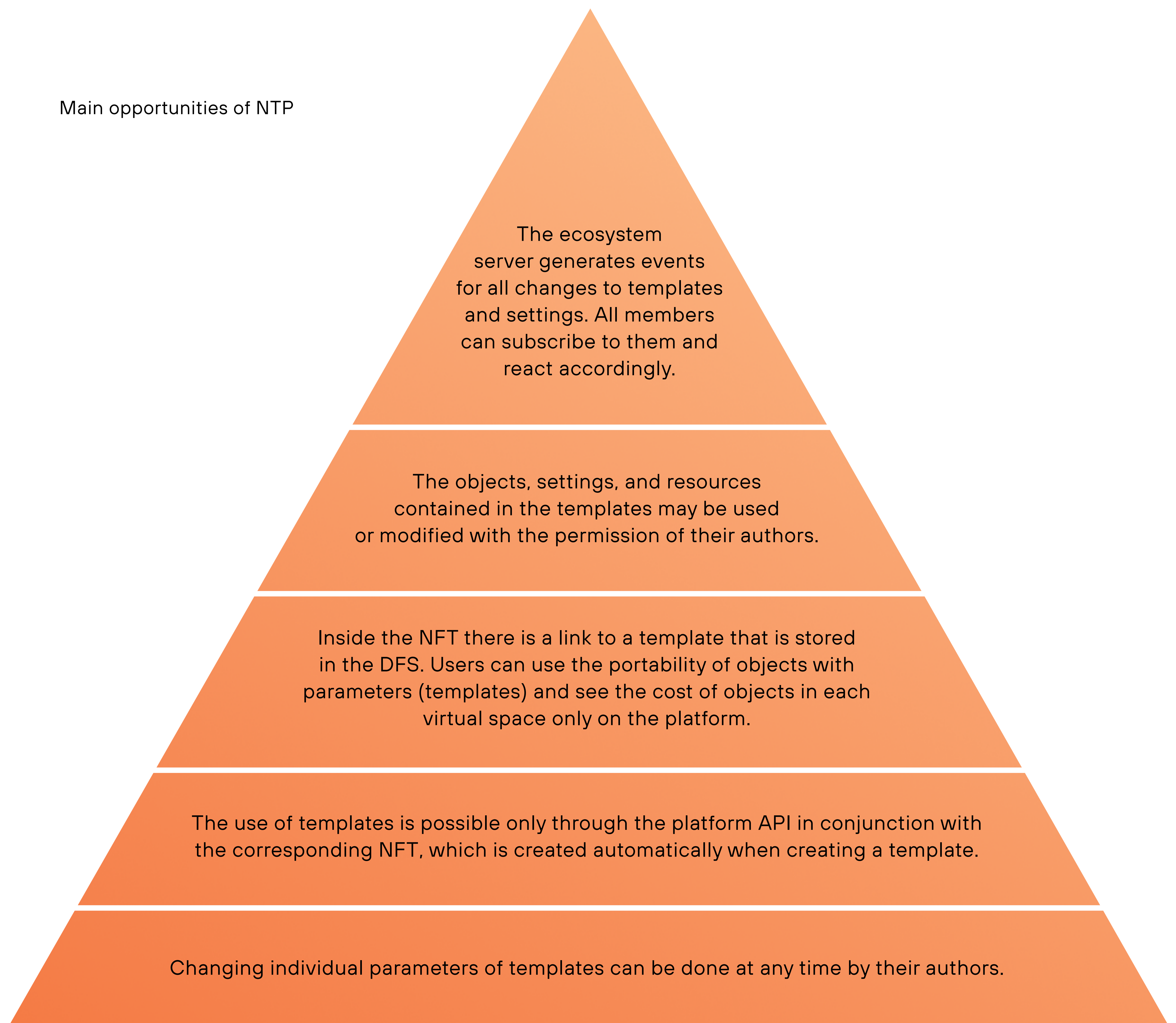
## Template description:

- **Author** - the creator of the template, can be an editor, if he has a game, or be an administrator (in this case, he/she doesn't set the coefficients for the game).
- **Editor** - the owner of a particular game, sets the rules for it.
- **After creating a template**, the author can only change the policies (at any time).
- **After creation**, editors change only their game coefficients and can add their parameters from their policies.
- **The author has no right** to change the coefficients of games if he is not their editor.



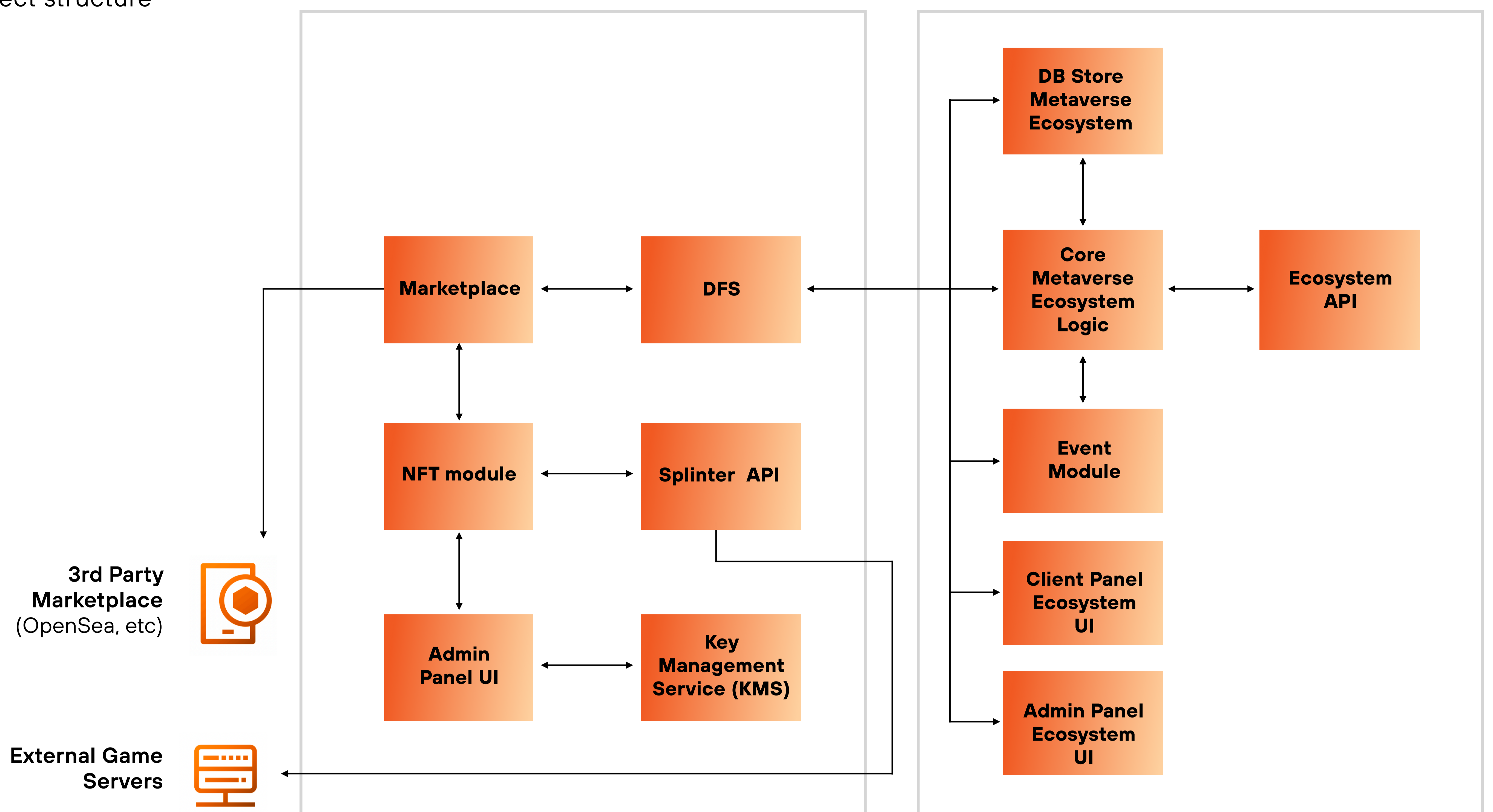
- **The values of wallets** (number of tokens) are changed by transferring tokens to them.
- **Link to the template** (Template ID) gets inserted into NFT.
- **REL** - policies (R-read, E-edit, L-licenced).
- **Tokens** - internal tokens of the ecosystem, bought by editors, used for mutual settlements in the system.
- **Set of resources** - a package of objects, which may include: name, image, textures, etc.
- **The coefficient of the game** is responsible for the ratio of game parameters concerning the tokens in the system blockchain. Each game will be able to use a different coefficient for the object, thereby allowing the object to fit into the format of the game more efficiently.

Main opportunities of NTP





## Project structure



## Description of Splinter NTP structure:

- **NFT module** – a module responsible for creating and managing a smart contract, the token of which is subsequently assigned to the game object.
- **Decentralized File Storage (DFS)** - a module for storing data about items tied to NFT (for example, images, information about an object, etc.).
- **DB Store Metaverse Ecosystem** - this module is responsible for storing templates of created NFT objects.
- **KMS (Key management system)** – a module responsible for storing and generating keys needed to identify users and provide them with functionality within the platform.
- **API Blockchain** - the module is responsible for storing, updating, and transferring information about the MFT, its status, the possibility of creating an NFT, and transferring ownership (transfers between wallets).





Feel free to reach out for any inquiries

Robert

Founder and CEO <https://t.me/robertratin>