Chainflix

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Overview

Overview

As smartphone adoption consistently increases, the broadcasting industry also faces a drastic change. People are now relying on their mobile devices to watch video contents. Thus, the emergence of online video sharing platforms began.

Despite the growing popularity of the online platforms, there are complaints and problems arising the operational structure of these video streaming platforms. Within the wide spectrum of problems with video streaming platforms, here are few major issues. High entry of barrier for, disparity in revenue sharing, inefficient advertisement campaigns metrics, and unwanted advertisements. Unfortunately, the platform operators are struggling to manage the increasing operational costs. Due to the innate platform architecture of video streaming platforms, the problems in the video streaming industry is near impossible to solve.

Chainflix project is implementing blockchain and artificial intelligence to restructure the platform architecture. By focusing on building a user-centric video streaming platform, Chainflix aims to solve the problems in the video streaming industry. Chainflix project – through a blockchain technology combined with P2P streaming technology - aims to solve this dilemma in current video media market by mitigating users' discontent and by reducing service providers' excessive costs.

Chainflix's innovative technologies allow to build a platform that significantly reduces operational costs while compensating every contributor to the platform. Until now, platforms did not prioritize user experience, acknowledge user contribution, and provide user compensation.

Chainflix, the revolutionary blockchain-based video streaming platform is creating a user-centric ecosystem. An ecosystem where individuals receive compensation for viewing, creating, enhancing, or storage.
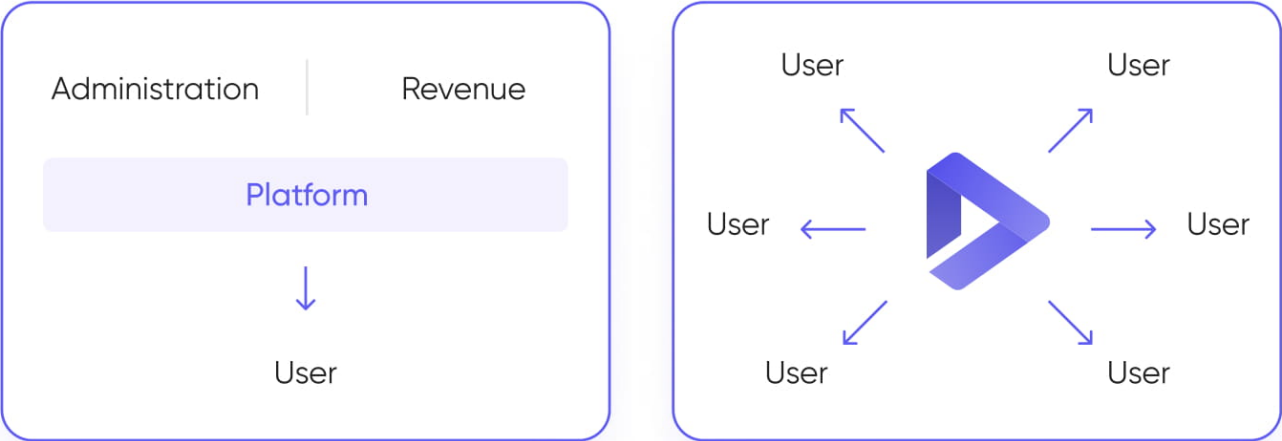
Fig. 1 Comparison of Ecosystems

Background

Video Streaming Industry

For any digital platform, users are the fuel to the ecosystem. Users upload contents, watch contents, and advertisements. However, majority of the revenue is distributed to platforms instead of users. Such discrepancy in the revenue sharing is now indicating a time for a new platform to solve these issues. Despite the inconveniences, however, the industry is growing while the market dominance is shifting major platforms. According to various reports, the video streaming industry is to grow to a market size of approximately $185 billion by 2027. Juniper, a UK consulting firm, recently released a report that the market volume for digital TV, video streaming, and OTT (Over-the-top) services would rapidly grow with companies such as Netflix and Spotify leading the market expansion.

If televisions initiated the era of video contents, the next generation is led by individual broadcasters and OTT service. The changing trend was perceived as a phenomenon led by only a limit number of enthusiasts couple of years ago. However, now almost every person with a smartphone is using such service. According to PwC Data, the global online video market reached $41.8 billion in 2016. By 2020, it is expected to further grow over $85.8 billion 2020 (annual average growth rate at 15.5%). While there are different type of platform providers, OTT operators can be classified according to two criteria: billing (advertisement vs. subscription) and content type (length, format, etc.) As most platforms provide their contents for free, service providers depend heavily on advertisement revenue for maintenance. Recently, platforms such as YouTube, Ustream, Vimeo, etc. are expanding their on-platform services such as sharing videos to different web services or social networking services through API(application programming interface).
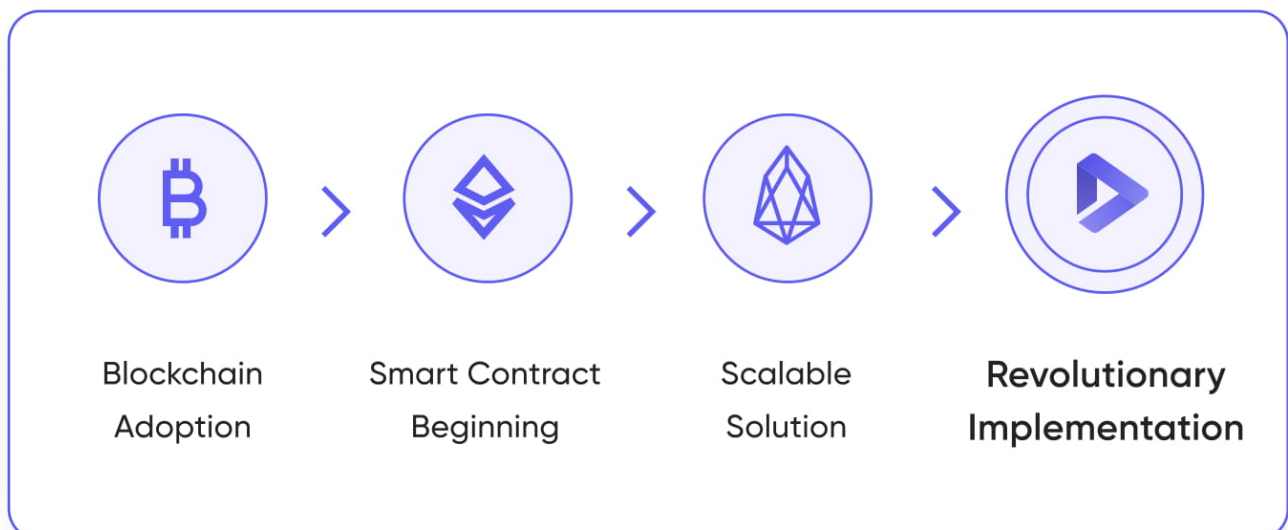
Blockchain

Due to the intrinsic technological features of blockchain, industry experts are now more eager to implement blockchain to solve the issues in the content media industry. Any platform is nonexistent without users uploading videos or watching advertisements, but users are not properly compensated. Thus, there have been attempts to create a user-centric platform using blockchain technology.

Blockchain technology can be defined as a digital public record or a decentralized ledger, which all members (node/peer) maintain the identical ledger each time a transaction occurs. Based on this blockchain technology, Bitcoin caught the public attention by utilizing Proof-of-Work (PoW) and blockchain to establish a digital currency.

In August 2008, an anonymous developer with the pseudonym 'Satoshi Nakamoto' pioneered establishing the digital cryptocurrency Bitcoin on an unidentified P2P network. Its first operation began when the Bitcoin software released in January 2009 based on Nakamoto's thesis. Since the first block generation (a.k.a. "genesis block), Bitcoin has continued to thrive without major breakdowns despite programming errors. life.

Blockchain Adoption		Smart Contract Beginning		Scalable Solution		Revolutionary Implementation

Blockchain technology is a General-Purpose Technology that represents the fourth industrial revolution. As the technology provides a ledger in a decentralized, autonomous, and open nature, there are multiple possibilities. Now with smart contracts technology consistently evolving, there are to be more blockchain-based applications.

Blockchain will be applicable in multiple industries and aspects of our lives. Not only can blockchain prevent from malicious actions and hacking, but also dismantle the centralized platforms and services.
Blockchain's true potential is yet to be released as most attempts of implementing blockchain technology focuses on the token within the ecosystem. Cryptocurrency (digital asset) within a blockchain-based ecosystem is to provide an incentive for all the peers to retain and enhance a platform.

After years of extensive research and tests, Chainflix has solved the issues with blockchain technology and devised a proprietary consensus algorithm to implement blockchain in daily life. Even further, Chainflix has implemented the ideological features of blockchain technology onto the platform operation.

Problems

Disparity	Inefficiency	Limited Reward

The rapid growth of global OTT market causes various problems. As aforementioned, platform providers are plagued by high cost of operation. Platform participants such as content creators, advertisers, and users are exploited during this process.

There are also growing concerns from the industry itself about the platform's opaque practices in revenue settlement. Thus, there are more traditional companies exploring blockchain-powered solutions.

Disparity in Revenue-Sharing

Users provide content, watch advertisements, and drive platform growth. However, within traditional schemes only platform providers take most of the profits generated on the platform. Due to such revenue sharing structure, there is increasing discontent amongst content creators. Viewers are also growing tired of endless display of meaningless advertisements without any reward.

Inefficient Advertising

As most people and users are spending time on digital devices, advertisers conduct their advertisement campaigns on video platforms. However, advertisers' complaints on inefficient pricing and outreach is consistently increasing. Even the world's largest video sharing platform YouTube cannot free itself from such problems.

Excessive Operational Costs

Platform providers are struggling to manage for astronomically increasing operational costs. To provide a stable streaming service, administrational costs, server costs, and hardware costs increase faster than user growth. While there have been technological upgrades to cloud computing, vulnerability to hacking is inevitable if it relies on a central server.

Solution

Our Solution: Blockchain-based P2P Streaming Platform

Chainflix aims to solve the issues by providing an innovative, technological solution. While current platforms are not user-centric, most platforms cannot convert their platform priority due to the platform architecture. Video sharing platforms such as YouTube and Netflix have the huge burden of astronomically increasing operational costs.

These problems (revenue disparity, inefficient advertisement, and limited rewards) are detrimental to the industry growth. Chainflix aims to solve these problems through technological innovations. Chainflix's platform architecture is significantly different from existing services as it implements blockchain's intrinsic features onto the platform. Unlike existing services, Chainflix does not rely on a centralized CDN (Content Delivery Network) but a decentralized storage system combined with our AI-powered content management controller.

Decentralized storage system (P2P Storage System) is not a novel technology. However, until now existing P2P storage systems could not have provided video streaming services. Most P2P storage systems have been used for individual file transfers and personal cloud storages.

Decentralized storage system (P2P Storage System) is not a novel technology. However, until now existing P2P storage systems could not have provided video streaming services. Most P2P storage systems have been used for individual file transfers and personal cloud storages.

Most video streaming platforms rely on a CDN (Content Delivery Network) to host, store, and stream videos. Chainflix utilizes a content management controller and AI-based distributed storages (Fig.3) to provide a reliable P2P-based streaming service.

Chainflix

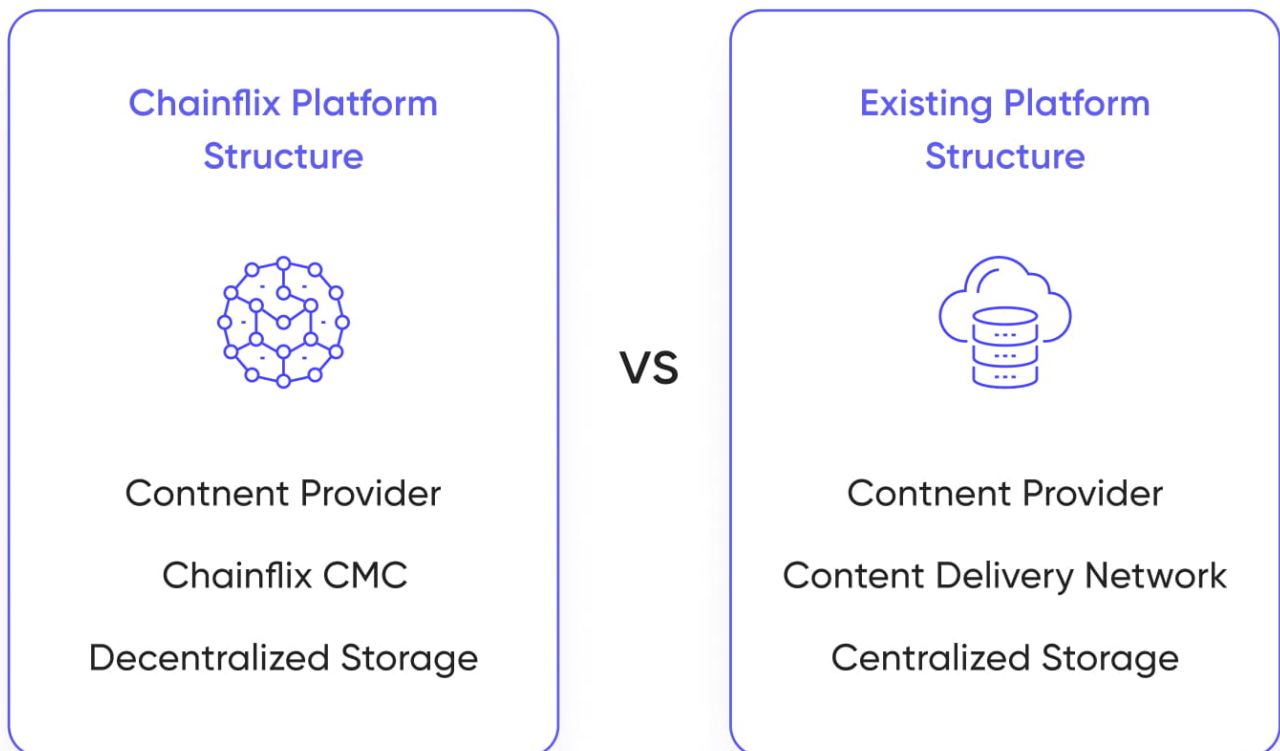| Chainflix Platform Structure	VS	Existing Platform Structure
Contnent Provider		Contnent Provider
Chainflix CMC		Content Delivery Network
Decentralized Storage		Centralized Storage

Figure 2. Platform Architecture Comparison

Individual or enterprise storage providers (peers) contribute their storage space to the platform. These storage spaces are programmed into the network of the storage pool.

Content creators upload and store their content in the P2P cloud storage pool and viewers can access the pool and watch such stored video content via streaming. The P2P storage pool is a virtual storage pool combining the storages contributed by peers into a network which links the peers in a meshed overlay structure.

Existing P2P storage structures (Fig. 3) cannot provide a reliable video streaming service. To resolve such issue, Chainflix's novel system handles the information manages all storages (peer)'s information within the cloud management controller.

The AI-based controller will manage peers' network status, peers' linkage status, available storage space, video data location, video data size, and more.

The controller will search for storages saving the identical video to disperse the traffic. (Fig. 4)
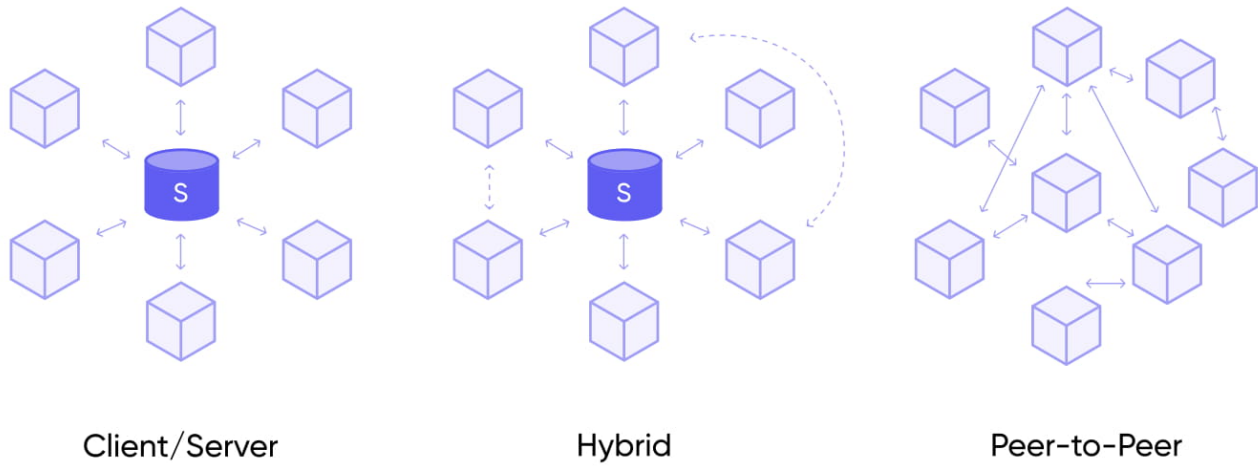

| Client/Server | Hybrid | Peer-to-Peer |

Fig. 3 Existing Cloud Structure

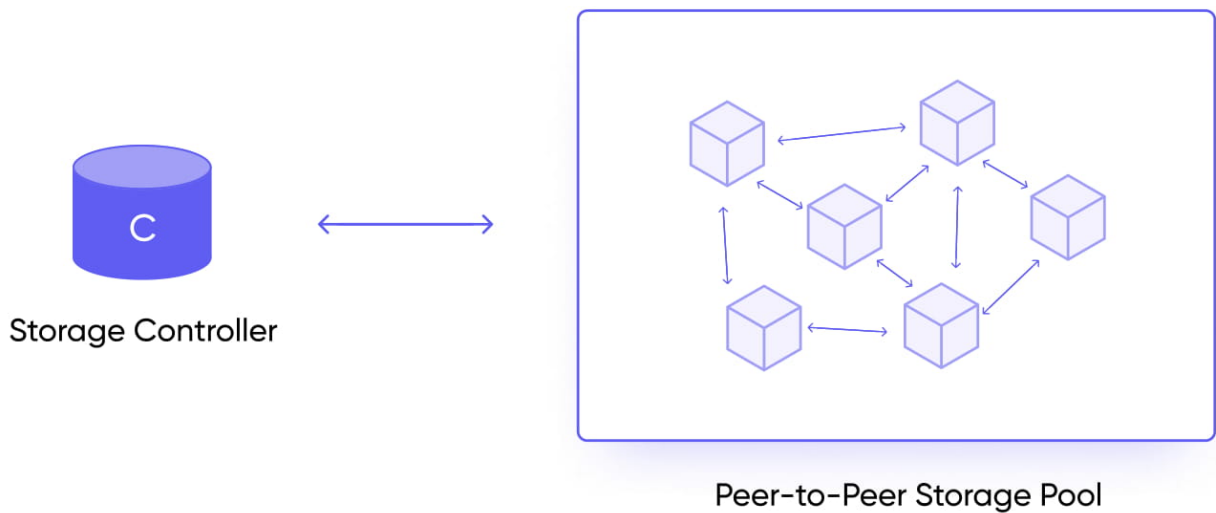Storage Controller

Peer-to-Peer Storage Pool

Fig. 4 Chainflix Cloud Storage Operation Structure

There are torrenting platforms and applications, which allow for streaming after a downloading period. However, Chainflix allows for an instant playback (streaming) of videos due to our storage structure. (Fig 5.) The connected peers to the storage pool save the identical original data.
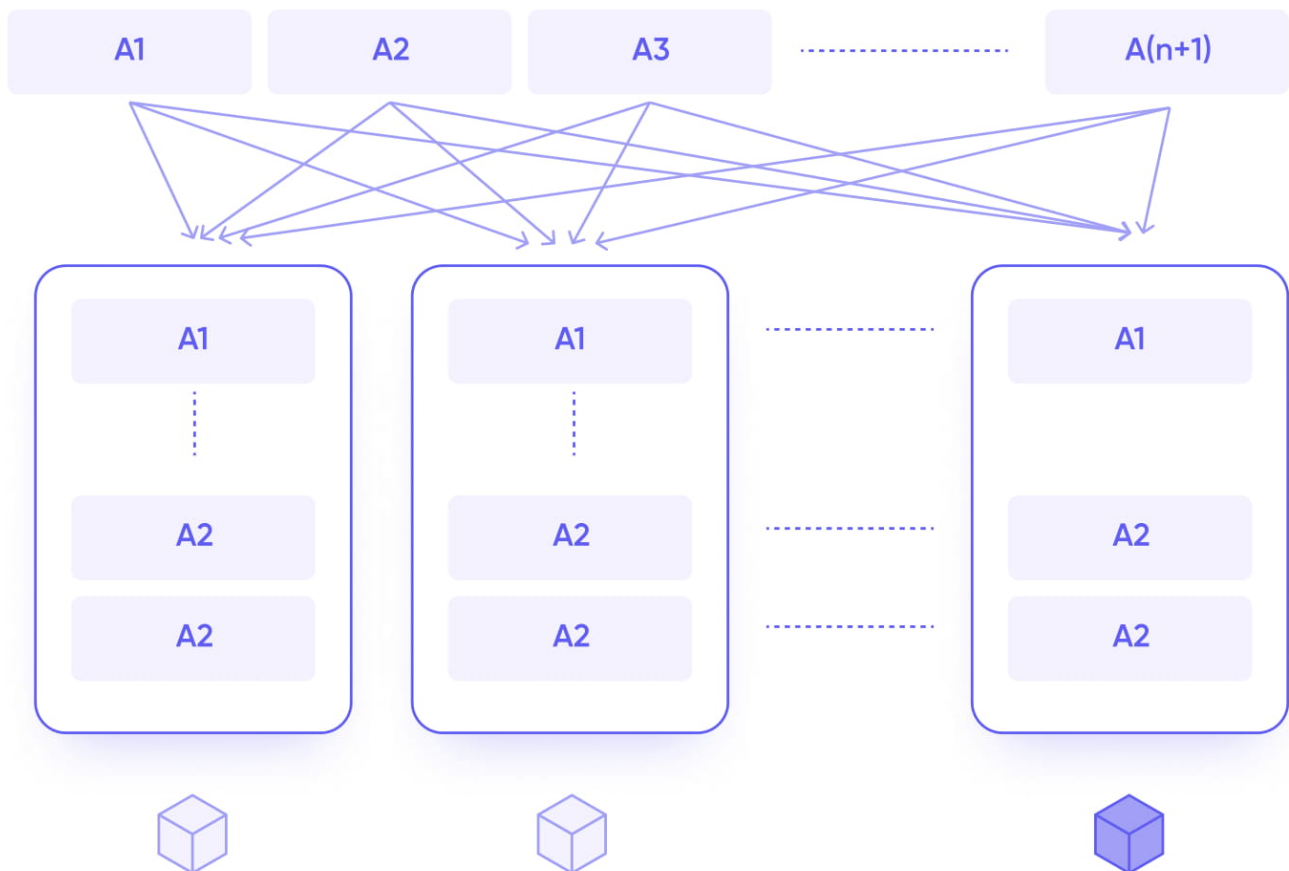
Fig. 5 Chainflix Operation Structure

As a platform provider, the novel platform architecture helps to reduce the burden of operational costs. While existing platforms' operational costs proportionally increase with user growth, Chainflix's situation is the opposite. By reducing operational costs, Chainflix creates a complete user-centric platform which rewards all participants: storage provider, content creator, viewer, and content enhancer.

Furthermore, to ensure the platform's integrity and operation, Chainflix offers an innovative media player enabling all ecosystem participants by watching videos in a proprietary view-and-mine system (Patent: 10-2018-0055608)

Chainflix's platform is powered by its native utility coin (CFX). CFX can be acquired from exchanges, bounty/marketing events, or mining. When users watch videos, different ecosystem participants can receive mining rewards depending on the content's mining distribution ratio.

Figure 6. Chainflix Media Player

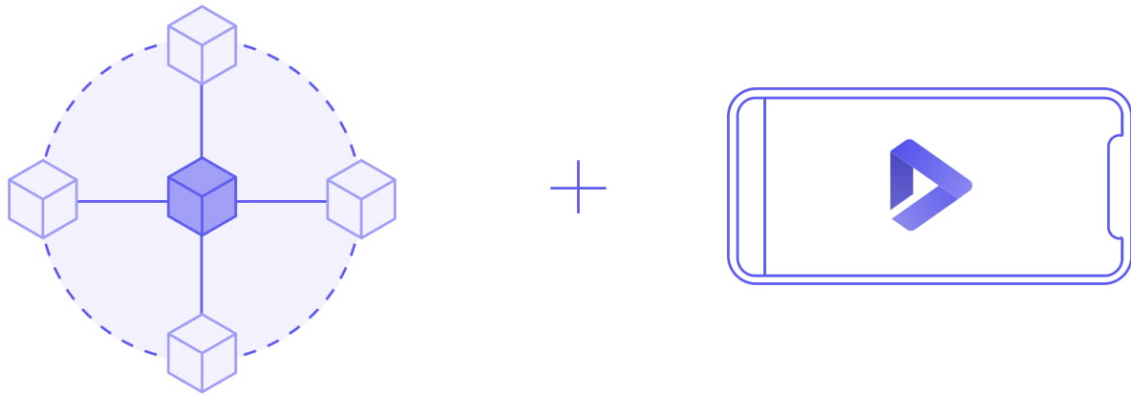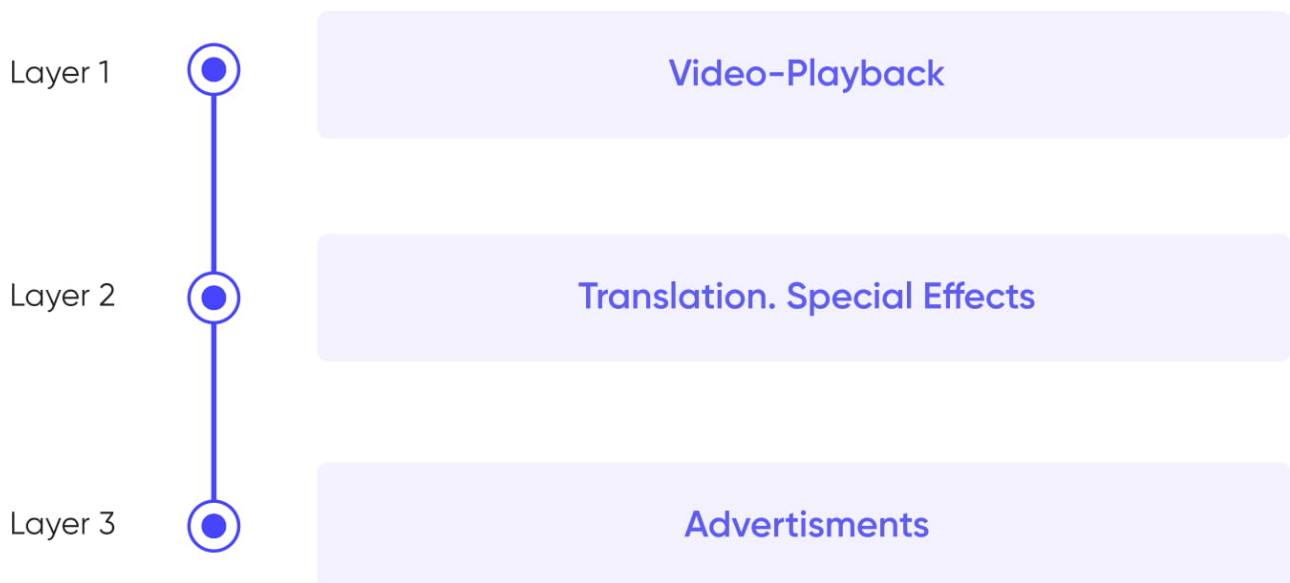On Chainflix platform, users can mine videos without special hardware or plugin. Chainflix team patented a media player-based coin mining system. (Patent filing no: 10-2018-0055608)

Layer 1	Video-Playback
Layer 2	Translation. Special Effects
Layer 3	Advertisments

Technology

Within Chainflix platform, video content is stored on the distributed storage pool. A distributed storage pool is composed of various type of storage providers. However as anyone could become a storage provider, Chainflix needs to provide multiple solutions for the storage providers to resolve connectivity and security issues.

In the case a storage provider contributes storage space via router, there is a connection error because only the router's public IP address will become a static address. The hardware that is connected to the router will have a private dynamic IP address. Each time a hardware is booted, the IP address will change, resulting in preventing file access.

Me (Computer A) **IP / Port Conversion** **Other Users**

100,100,100,100:3

Router (NAT)

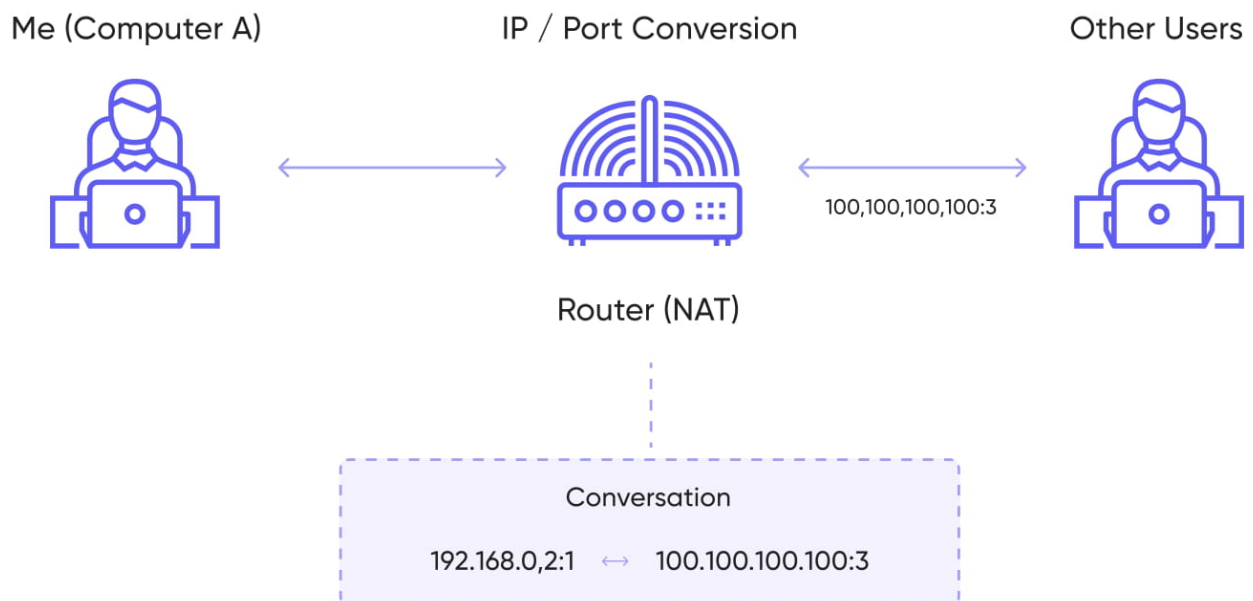Conversation

192.168.0,2:1 ↔ 100.100.100.100:3

Fig. 7. IP and Port Conversion on Router

To playback a video in a P2P state, the viewer (Computer A) will need to communicate with the storage provider (Computer B). However, viewer will not know the storage provider's Private IP or port number. Thus, Chainflix has resolved this issue using 'Hole Punching Technology'.

Chainflix

Hole punching technology enables the connection between Computer A and Computer B even if both peers are using private IP addresses.
However, to provide a reliable streaming service in P2P state there is another technology required to manage sudden increase in traffic or bottleneck problem when a single content is viewed a lot. Thus, Chainflix developed the novel storage controller.

Router (NAT)

Private IP: Port	Public IP: Port	Public IP: Port
192.168.50.10:58010	175.194.21.149:60010	124.137.26.36:12000

IP: Port
100.100.100.100:15000

Added to Mapping Table Data on the Router

192,168,50,10:58010 ⟷ 175.194.21.149:60010
124.137.26.36:12000
100.100.100.100:15000
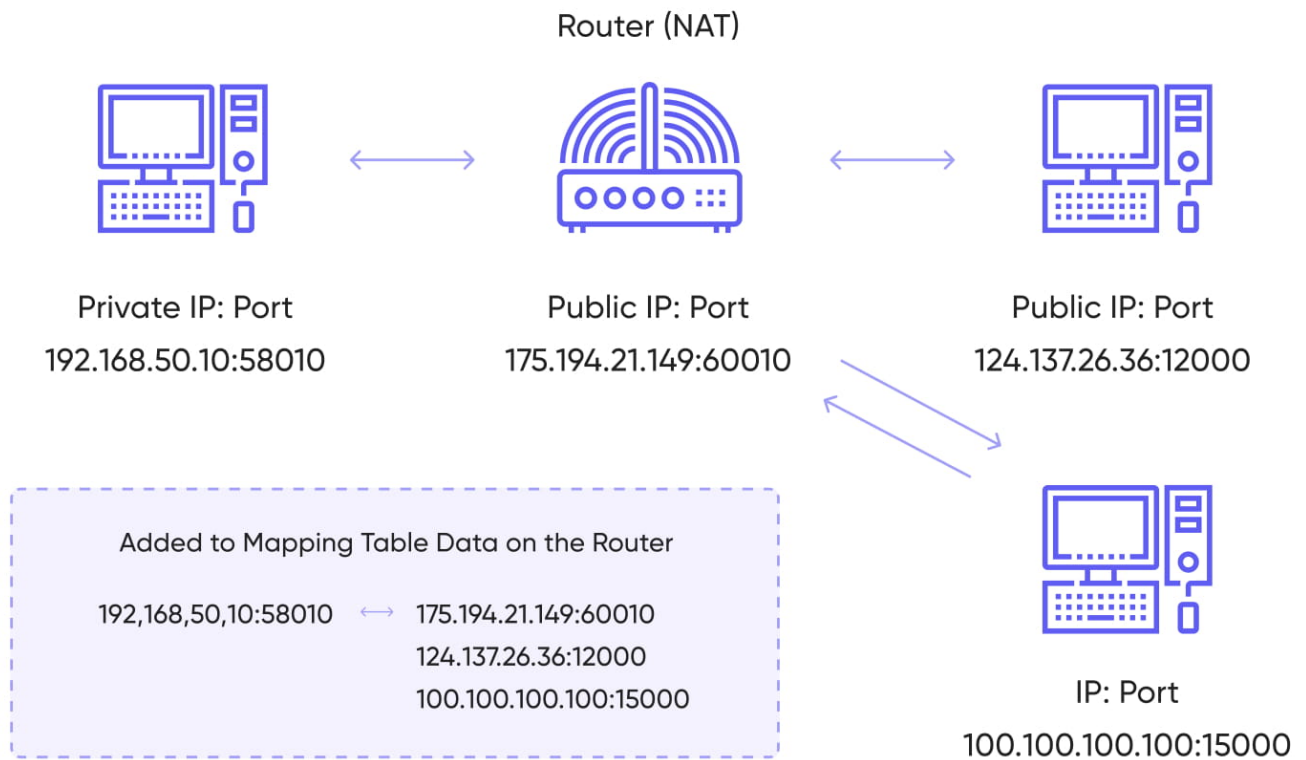
Fig. 8. Mapping Table Data on the Router

The Storage Controller manages each individual storage provider by checking connectivity and inducing/requesting storage space. The Controller also disperses traffic, verifies block generation, and rewards the viewers.
In traditional P2P video streaming architecture, connected peers are unaware of the content data stored by other peers. This leads for the peers to exchange buffer maps and then request for necessary data. However, within Chainflix's platform, as the Storage Controller connects the storages together there is no need to re-check the content data stored in certain peers.

Fig. 9. Chainflix P2P Platform Structure

Chainflix AI Distributed Storage System. Overview

To store different type of contents such as music or video, platform providers require large storages (TB). However, storages in such size is not only inefficient but also prone to overflow of web traffic. Consequently, most platforms' operational structure is inefficient in pricing. The establishment cost for 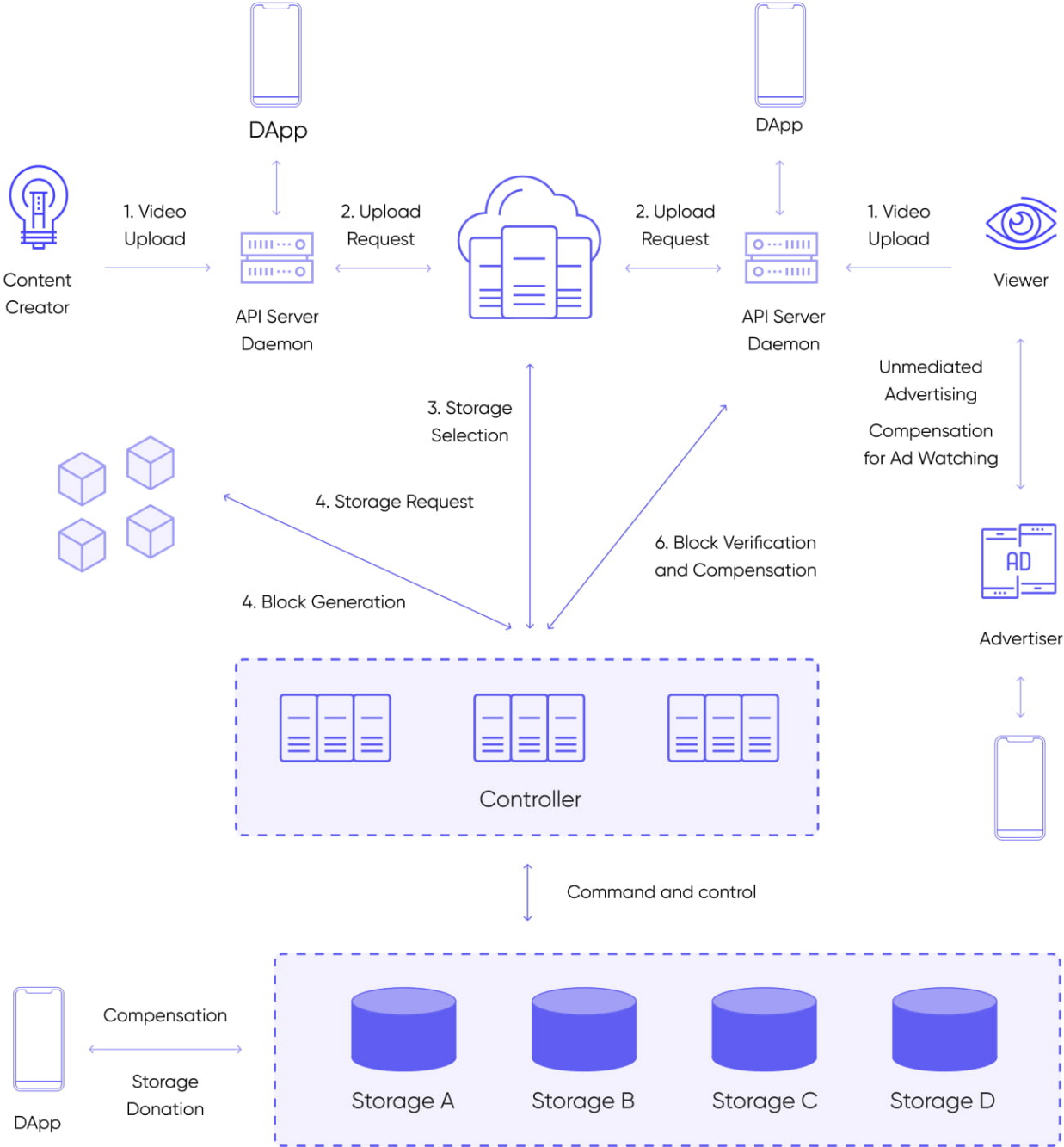a content management system is extremely high. Normally platform providers will establish their first storage system and later expand depending on the needs. However, as the operational and establishment costs are extremely high, often user rewards are compromised. Chainflix is resolving this issue by utilizing individual storages providing spare storage to the storage pool.

Decentralized Storages   Chainflix AI
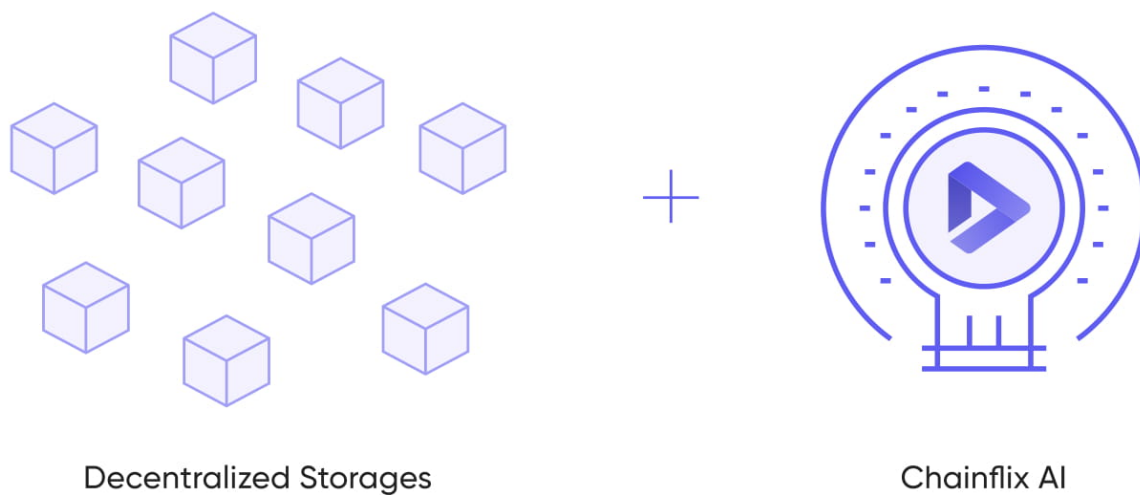
Fig. 10. Chainflix Operation Scheme

On the Chainflix platform, ordinary users can provide spare storages to the storage pool. The novel AI-controller's purpose is to manage different individual storage spaces for content management and decrease the initial establishment costs that platform providers struggle with. The secondary purpose of this technology is to implement a coin mining system to reward the individual storage providers an incentive to contribute storage to the distributed storage pool. By having storage providers to have the chance to mine CFX based on the predetermined mining ratio, the initial difficulties of acquiring servers will decrease.

Controller Roles

To ensure the distributed storage pool properly functions, the proprietary AI-based storage has multiple functions and roles within the system. The controller monitors the different storage nodes' connectivity, nodes' web traffic, and content distribution status (number of contents stored as a seed file). The controller also manages to have the different nodes to intercommunicate and synchronize to ensure that each node has the minimal requirement of seed files for streaming. The controller will prioritize nodes with the most storage space to stream when there is a playback request; simultaneously the controller will convert the content information into an immutable hash and store in the DB. When a viewer begins playback, the controller will extract the immutable hash from the DB and verify the content viewership. Based on the storage nodes' traffic, using the backend API server, the controller will utilize the node with the least traffic to stream the video for the viewer.

Distributed Storage Pool Architecture

The distributed storage pool is designed to have many individual storage providers storing different video contents provided by the content producer. When a user streams a video, depending on the throttle BPS, the AI-controller will stream the videos in block-sized data based on system environment. When the data is streamed in live status, there are different participants to the technical ecosystem. Storages (nodes) intercommunicating and exchanging files; a frontend server receiving content saving request from content producers then displaying the video content; a backend API server rewarding the different storage nodes when streaming the requested video playback.
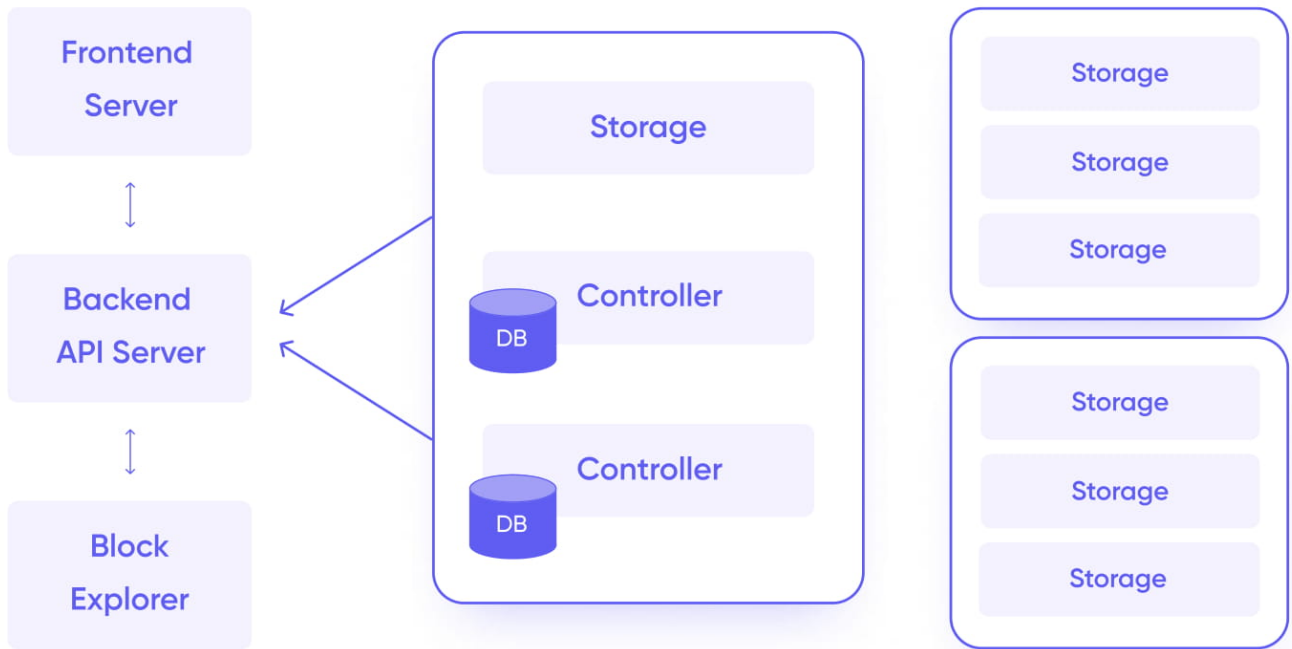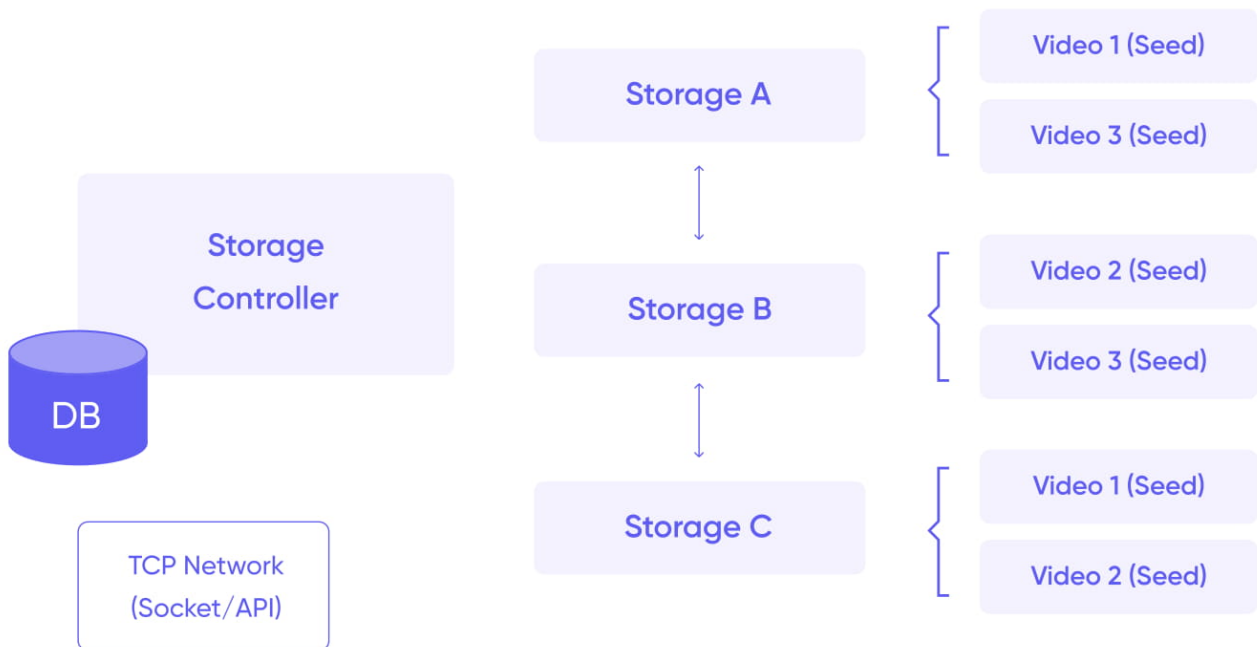
Fig. 11. Distributed Storage Architecture

Fig. 12. Distributed Storage Architecture

Terminology

100: Storage Node
200: Frontend Server
300: Backend Server
400: Storage Controller
410: DB

Distributed Storage Pool Features

[0008] Storage nodes are storage providers who can contribute individual computing power and spare storage space at any time. Storage nodes are part of the P2P architecture, and nodes are not platform-centric and owned by companies like YouTube or Netflix.

[0009] Throttle BPS is calculated based on the video's length and playtime. The system environment would include transmission speed, memory, and storage. The immutable hash may include SHA-256 hash key.

[0010] When a video content is uploaded from the content producer's device, the storage controller can record the content's title, length, and playtime on the DB.

[0011] The storage controller will communicate with the different nodes through the socket and RestAPI format. By consistently checking the storage node's connectivity, the controller can delete the disconnected node's content information from the DB.

[0012] When multiple users request playback from an identical video content, the node will provide the live streaming data to the controller. The controller will register the content with multiple requests as a 'popular video' and request the nodes to duplicate the video seed. Once the nodes complete the duplication, the completion status will be communicated to the controller. However, if the content fails to maintain its status as a 'popular video' the seed files will be slowly deleted from the nodes based on the system's algorithm.

Distributed Storage Pool Impact

Storage providers are provided a reward, if and only a viewer mines the CFX based on the proprietary 'View-and-mine' system. During this process, storage providers do not receive more rewards by providing a certain storage requirement. Only if the storage stores and streams a video to the 'mining viewer' will receive a reward.

Chainflix Blockchain

Chainflix is an Klaytn-base framework, consisting of the Chain Network and the Content Network. Chain Network, the actual blockchain-operated key core, conducts the role as a node to generate a block when a video is watched.

In the initial phase of development, Chainflix will implement PoA (Proof-of-Authority) consensus algorithm to ensure transaction speed and service quality. By 2021, Chainflix intends to transition into a hybrid blockchain implementing a dual blockchain algorithm – PoA & PoV (Proof-of-Authority) and (Proof-of-View)

PoA (Proof-of-Authority)

PoA is a term started by Gavin Wood, co-founder of Ethereum and Parity Technologies. PoA consensus algorithm is commonly used in private blockchains to increase transaction speed and decrease the number of validators.

How does it work?

Within the PoA algorithm, designates a certain account as a Validator -- the validity checker – that performs the validity-checking for transmissions and blocks. A method in which certain nodes with authority take turns generating blocks, it can reduce block time and prevent computing power waste that is one of the main shortcomings of POW.

Chainflix

PoA has the merit in being able to process thousands of transactions per second without sacrificing a considerable amount of memory and energy. PoW (Proof of Work), PoS (Proof of Stake) and PoA (Proof of Authority) all have own strengths and weaknesses. PoA has big advantages in terms of high transaction speed and expandability, while PoW and PoS is superior in decentralization.

Category	PoW	PoA
Verifying Method	Proof-of-Work	Proof-of-Authority
Nodes	Mining, Transaction	Validator
Application	Geth	Parity
Compensation	Mining	None Due to Non-Mining
Block-Generation Time	10~20 sec	2 sec
Main Employer	Bitcoin, Ethereum, etc	Private Blockchains
Features	Waste of Computing Power, Low Transaction Speed	High Trnasaction Speed

Fig. 13. PoW and PoA

Chainflix's implementation

Chainflix's blockchain network has adopted the PoA scheme because it would be necessary to reduce validity-checking time and assure quicker block-generation and transactions-processing in a private blockchain structure, given that there would not be a lot of Validator nodes taking part in the Chainflix blockchain network in early stages of service.

PoV (Proof of View). Overview of PoV

Chainflix platform adopted a patented, novel media player-based coin mining system (a.k.a. 'View-and-Mine'. Under 'View-and-Mine' implementation, the system will consistently check the nonce value of a viewer's node during the playback and allows block generation. In this case,

View-and-Mine is Chainflix's own media player-based coin-mining system that constantly checks the nonce value of a viewer's node during the playback and allows block generation, in case of correct nonce value-matching, for coin reward.

Chainflix's PoV scheme is effective, along with the coin-mining function, in keeping track of viewing records, preventing traffic concentration in specific video content and virtually making malicious content tampering and hacking impossible.

In Chainflix's View-and-Mine system, a viewer has an opportunity to take part in the coin-mining pool merely by watching the video content.

Unlike other coin-mining systems, in Chainflix's View-and-Mine system coins are distributed among video creators, viewers, storage donors, and the like, according to predetermined dividend rates, instead of being monopolized by the miners.

The viewer has nothing to do but press the play button, which automatically triggers the mining process by an algorithm embedded in the media player. This process would not consume more than 10% of the additional hardware computing resource of the viewer who is just to be notified of block generation as it occurs during their video-watching.

Due to our proprietary 'View-and-Mine' system, when a viewer presses the 'play' button to watch a video, encrypted video information and decoding key are transmitted from the Chainflix blockchain network to the viewer's device.
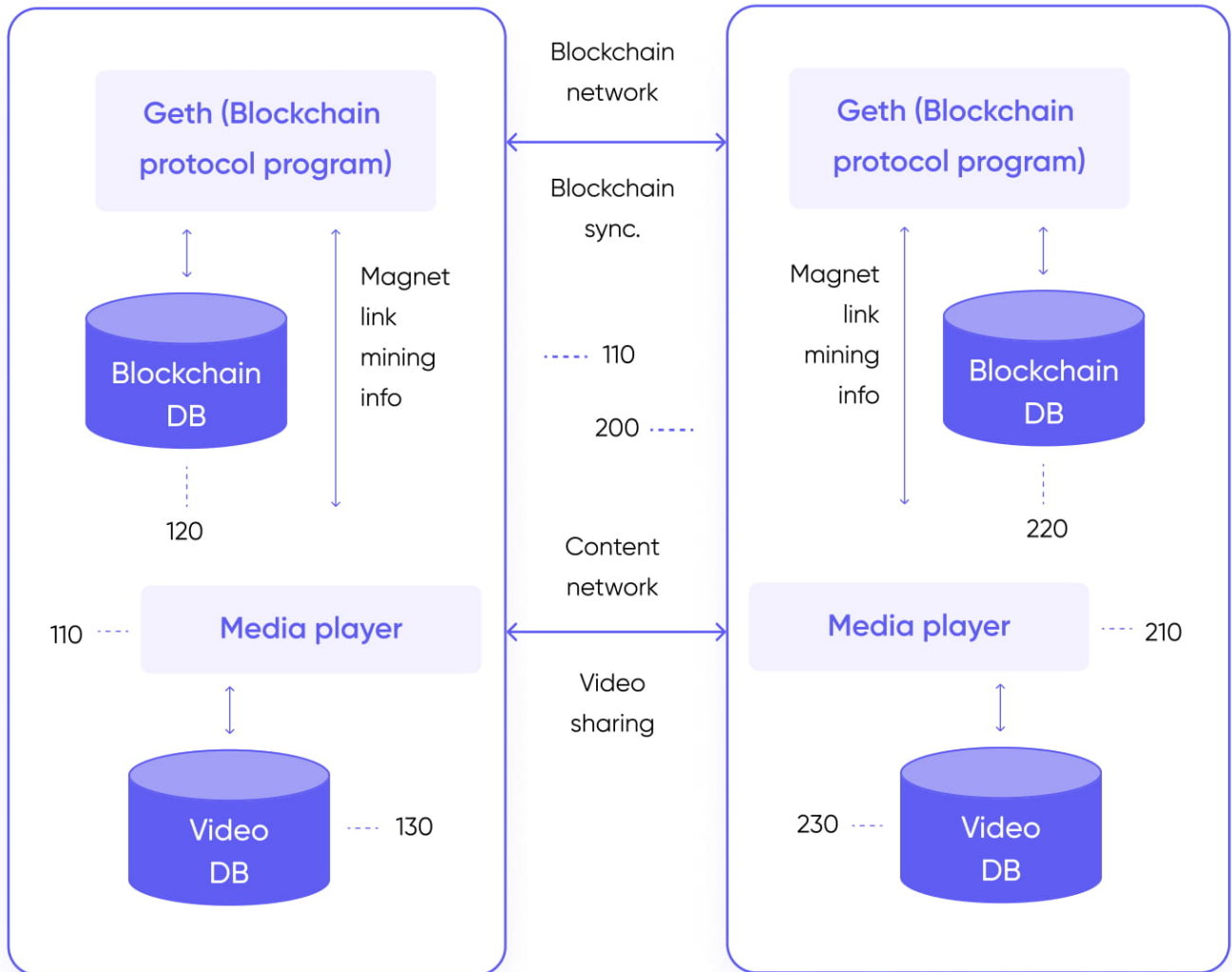
Fig. 14. Chainflix Operation Scheme

Definition of Terms

Magnet: Unique identifier of the video

Video Information: The information including the Magnet, video title, creator and VideoCell ID but not the actual video data.

VideoCell: A piece of video sliced to 1-minute cells which is the minimum time unit to be sent from, received by, and managed on, our network. The user who downloads a 60-minute video will have a total of 60 VideoCells. A VideoCell is to be downloaded to just a single user at one time.

VideoCell ID: A distinct ID to identify the VideoCell

DownloadKey: A distinct code issued by the verifier to share videos. Users are issued of different DownloadKeys for different VideoCells. There is no duplication – double-issuance -- of DownloadKeys for each user and each VideoCell. If an user re-downloads a VideoCell after it has been deleted, he or she gets the same DownloadKey as acquired previously. Every VideoCell is transmitted in encryption by the DownloadKey.

When a viewer press the 'play' button to watch a video, both the video information encrypted in unique serial numbers and the accompanying decoding key are transmitted from Chainflix blockchain network to the viewer's device for the video to be watchable. This is Chainflix's PoV scheme and the proprietary View-and-Mine function is executed in this scheme.

View-and-Mine is Chainflix's own media player-based coin-mining system that constantly checks the nonce value of a viewer's node during the playback and allows block generation, in case of correct nonce value-matching, for coin reward.

Operation Structure

The Chainflix Platform consists of Chain Network and Content Network.
Chain Network is the key core of the platform operated on the actual blockchain technology to take the role of a node in generating blocks while watching a video. Content Network provides subtitles, dubbing and various services of solution providers through Klaytn's smart contract function.

Chain Network   **Chainflix**   **Content Network**
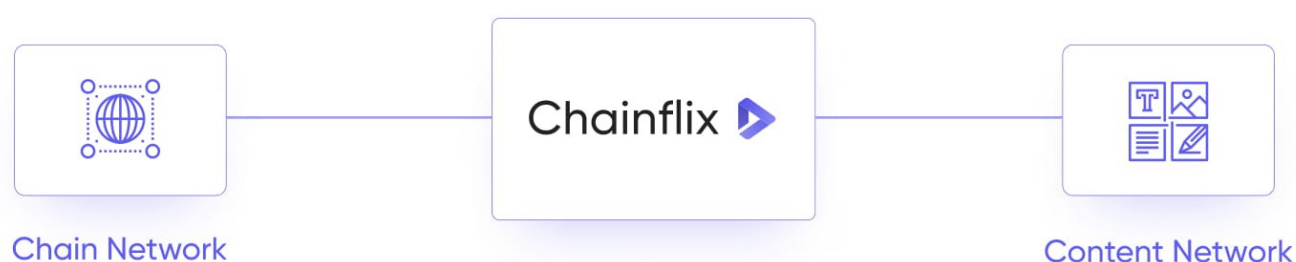
Fig. 15. Chainflix Operation Scheme

Chain Network

Chain Network is where the blockchain-based services is operated. Different type of transactions and smart contracts are executed, and address information of uploaded videos (subtitles, dubbing files, graphic effects, and advertisements) is stored. On the chain network, the video content itself is not stored as the data size per video will risk the streaming quality.

In a typical P2P-based operation, there is no viable option to record and verify a user's viewing records for a transparent compensation. However, the Chain Network resolves this issue by using the aforementioned 'View-and-mine' function.

Video contents distributed within the Chain Network are embedded with powerful DRM functions, which will disable duplication. Therefore, there is no other method to receive mining rewards (CFX) other than the Chainflix's proprietary media player. Within the DRM function, there is data related with mining included which will enable the PoV implementation.

Content Network

Within the Content Network's platform structure, Chainflix's media player (110 and 210) is structured in multiple layers. The first layer streams the original video, the second layer streams subtitles and special effects. For those content enhancers, if their 'enhancement' is distributed within the second layer, block rewards are distributed depending on the predetermined mining ratio. On the third layer, advertisements are played. To showcase an advertisement, additional expense is required. If and only the advertisement is played or clicked, advertisement fees are deducted. Once the advertisement fees are all used, the advertisement will no longer have an outreach. Thus, the transactions and activities on layers two and three are controlled and executed by smart contracts.

Various P2P devices (100 and 200) will play the video contents from the Content Network. Through the Content Network, video contents are mutually shared. In this exchange, creators and viewers devices are included.

Such multiple P2P users' devices (100 and 200) may additionally contain the blockchain database (120 and 220) that stores blockchain data, on the one hand, and the video database (130) that keeps address information (own URL's) matching various video content – or subtitle files, dubbing files, graphic effects, video ads -- registered on video content service sites like YouTube, Ustream or Vimeo, on the other.

Chainflix may allows smartphone or low-power devices to access remote nodes. As remote nodes do not share or store all data within the blockchain network, there is minimal technical requirements to use the fully functional 'view-and-mine' media player.

A device accessing the remote node will only keep its own transactions and contracts within the device. To provide functional stability of the mainnet, each user's P2P device (100 and 200) can self-establish remote nodes by geographical regions.

Description of the Symbols
100, 200: P2P Communication User's Device
110, 210: Media Player
120, 220: Blockchain DB
130, 230: Video DB

As each P2P device has access to 'view-and-mine' enabled media player, once the device plays back at least one video, the device participates the blockchain network as a node generating and verifying blocks.

The media player is the essential component to the media player-based mining system. While the video is streamed to an individual user, the video data is decoded. During the displaying process of the video playback, the View-and-Mine technology is implemented to consistently check the node's nonce value. Thus, the media player-based mining system generates blocks as the nonce value of the P2P nodes are verified during the playback process.
 mentioned above, the media player forms the core of the media player-based coin-mining

The Content Network also provides a distributed storage service for video contents. Only PCs can participate in the distributed storage pool. Each PC is controlled by the AI-based storage controller. Depending on the computing power contribution of the individual storage provider, the storage provider has higher chances of receiving mining rewards.

PoV Algorithm

The following figure describes the algorithmic process of PoV (Proof-of-View).

Chainflix

```
┌──────────────┐ ┌──────────────┐ ┌──────────────────┐ ┌──────────┐ ┌──────────────┐ ┌────────┐
│Content Creators│ │ Service Host │ │Storages Controller│ │ Storages │ │ Chain Network│ │ Users  │
└──────────────┘ └──────────────┘ └──────────────────┘ └──────────┘ └──────────────┘ └────────┘
```

1. Video Registration
Request

Continuous Notification
of Storage Status

Registration Eligibility Checking

2. Video Storage
Request

Confirm the Storage

3. Transmission of
Storage Information

4. Transmission of
Storage Information

5. Upload the Video

Store the video

6. Notification of the
Video Storing

**Registration of
Video-Sharing Information**

7. Notification of
Video Upload

Video-Registration Complete

8. Video-Watching Request

**Confirm the Video-
Registration Information**

9. Request for Video
Storage Checking

Chainflix

Content Creators	Service Host	Storages Controller	Storages	Chain Network	Users

Confirmation of Video-Sharing Information

10. Transmition of Storage Information

Sharing Video-Watching Information

11. Transmission of Video Storage Information

12. Request for Vidoe-Streaming

Storing Vidoe-Streaming Information

13. Video-Streaming

Video-Wathcing

14. Notification of Video-Streaming Information

Mining Decision

15. Notification of Mining Results

Check the Rate of Dividends

16. Request of Coin Allocation

Keep Mining Information in the Contract

17. Coin Payment to Viewer

18. Coin Payment to Storage Donor

19. Coin Payment to Content Creator

A Content Producer's video is split by the minutes(VideoCell) and shared in a P2P state. When the VideoCells are transmitted, a key value is received from the verifier for encryption. Once the VideoCell is encrypted, it is transmitted to the verifiers.

Viewers watching the videos can also share contents with the Content Producers in the same P2P manner. New viewers can download VideoCells, request for Play Data, decode the VideoCells, and calculate the hash value during the display process.

Using a random constant and a hash value in the background, the user is calculating the nonce value with a relatively low difficulty. Once the viewing process is done by the VideoCell units, the viewer will transmit Nonce Value and Play Data to the verifier in an encrypted personal key. If the video playback time is 1.5 times longer than the nonce value calculation time, the process is deemed as a failure.

Verifier A will store the hash value generated within the P2P sharing process in a DB. Once a unique viewer-specific PlayCode is generated, for the identical VideoCell there is no identical PlayCode issuance for the identical account.

Viewer's wallet ID and Play Data is stored in a separate DB. Once stored, the Play Data is synchronized between the verifiers. Also the verifier will check whether the user's Play Data has the correct nonce value. If the time difference between the transmission of the random constant to the viewer and the reception of nonce value is less than the VideoCell's playtime, the process deems as a failure.

If the process is successful, the block is generated, and the block reward is distributed. The viewer's information is stored on the block. Once the block is generated, the information will be transmitted to other verifiers for synchronization.

Verifier B will store the Play Data transmitted from Verifier A on a separate DB. Verifier B will confirm the block received and confirm the information stored on the block.

A block's normality is voted between the verifiers. If the voting results in 51% for success, the block is added to the chain. If a normal block is generated, the block reward (CFX) is distributed to Content Producer, Viewer, Verifier, and Storage Provider depending on the predetermined mining ratio.

To prevent overcompensation per block reward, the compensation amount reflecting the half life is also recorded. As the block time is also recorded, only a certain pre-set amount of block reward is distributed regardless of the block generation time.

If the verifier requests for the block reward, other verifiers will vote on whether the compensation will be distributed. If the vote results in over 51% for distribution, the CFX reward is distributed to the recipient.

Content Producer, viewer (user), verifier, storage provider and other ecosystem participants are considered as the potential reward recipient.

In a similar scheme to Ripple and Stellar Lumens, a potential verifier must meet the following qualifications.
- Ability to maintain fast internet connection.
- Own a reliable, safe network hardware
- Have a server with adequate technical specifications.

Once a verifier receives the content distribution request from the Content producer, the video's unique identifier, total playtime, number of Video Cells, and the Producer's information are all recorded on the blockchain through the Dapp. Due to blockchain's nature, a registered information cannot change.

To prevent illegal content registration, there will be a separate content supervisor. The supervisor's information will be recorded on the blockchain. The supervisor could be public organizations or government institutions. The supervisor will check a Content Producer's eligibility prior to distributing contents to the blockchain network. If the distributed content has a copyright issue, video streaming must be discontinued.

Content producer must submit the required information the supervisor's requests. The supervisor will have a mandate to protect the personal information.

Personal information will vary per country or organization. Chainflix will not be involved in storing or checking personal information in this process.

Supervisors will have the authority to impose restrictions on any illegal content distribution. Supervisor can also receive block reward depending on the pre-set mining distribution ratio.

To prevent the fraudulent abuse of the PoV by only sending hash values without the VideoCell, Chainflix will allow users to periodically conduct nonce value calculation only once. The cycling period will reset every 10,000 blocks, where the nonce value calculation is reset.

Also to prevent fraudulent use, a verifier can reject requests for encrypted key values or PlayCode information based on the IP address.

Chainflix provides a media player-based coin mining system where coins are mined during the P2P video playback. Chainflix R&D team is consistently developing solutions to increase the blockchain's integrity to protect individual's assets. In the initial phase of the development, Chainflix will provide the nodes necessary to verify and generate the blocks to prevent from trust issues.

Ecosystem

Chainflix Application. P2P Video Sharing

At the heart of Chainflix's ecosystem, Chainflix's P2P-based video sharing platform is a content distribution platform available on both web and mobile. Within the application, there is a view-and-mine embedded media player and an electronic digital asset wallet to enable token mining, exchange, and trading.
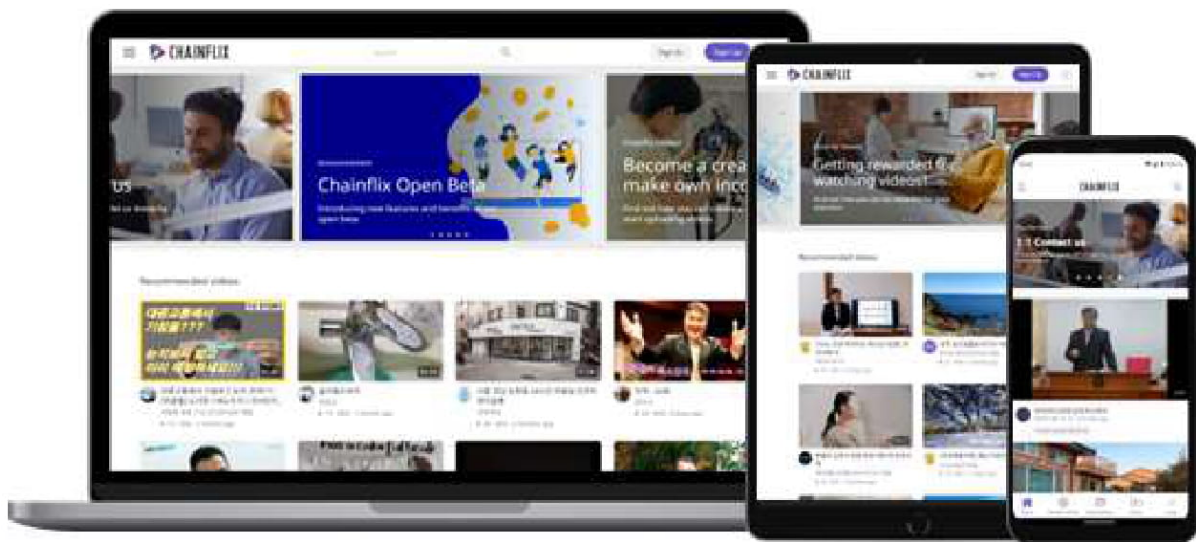
Chainflix is creating a digital ecosystem to enable as many service providers to utilize the media player's core technologies. For service providers providing subtitles, dubbing, and video-related solutions, Chainflix is providing the necessary program sources on Github to create a developer community and a public, decentralized ecosystem. Chainflix will also provide a variety of multimedia services that conventional platforms could not have provided such as resource-sharing, broadcasting, and advertising.

By significantly reducing the operational costs due to the novel platform architecture, Chainflix can reward every ecosystem participant: viewers, storage providers, advertisers, content producers, and content enhancers.

Ecosystem
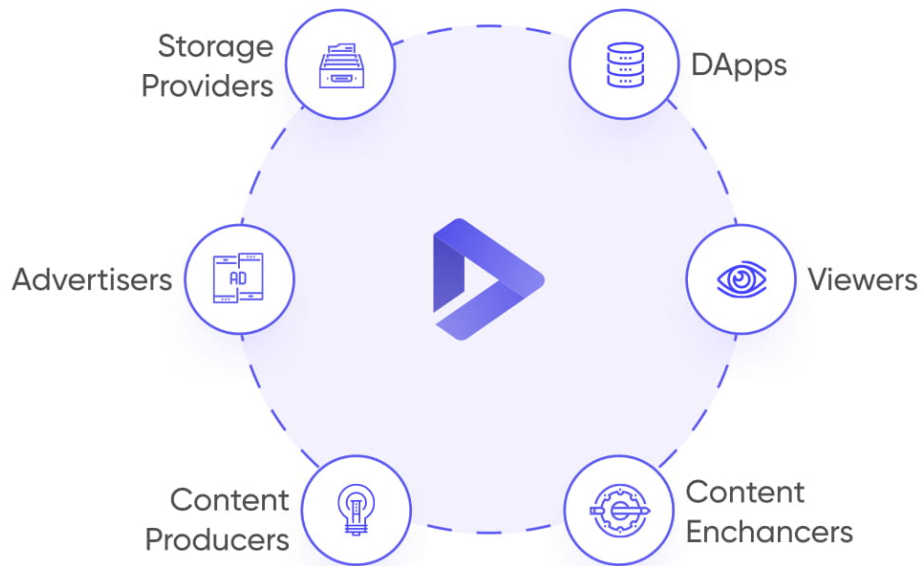
Content Creators:

When Content Creators upload and distribute their video content to the platform, they can decide the CFX mining ratio between themselves, viewers, and enhancers.

Content Viewers:

Viewers can simply earn (mine) CFX coins by simply watching videos on the platform. They can also watch advertisements for additional coins.

Content Enhancers:

Content enhancers can earn CFX coins by enhancing videos (providing subtitles, dubbing, etc.) Enhancers can sell their solution within the decentralized marketplace.

Storage Providers:

Storage providers can earn coins when their storage space is used for streaming videos.

Advertisers

Advertisers can utilize the smart contract-powered advertisements for select marketing and efficient cost.

DApp

Decentralized Application (a.k.a 'Dapp') are any form of online service powered by blockchain technology. The key difference between ordinary services such as Gmail or Uber and a decentralized application is that all source codes are open source and secure by immutable smart contracts.

Different from smart contract platforms like Ethereum or EOS, Chainflix intends to provide an ecosystem for Dapps to have an independent service operation to create a synergetic ecosystem as a whole.

Ecosystem architecture

For a Dapp to operate, it is important to understand how Dapp will provide their service. Within Chainflix's ecosystem, Dapps can operate in a hybrid-manner. Certain operations can be made off-chain to expedite traffic processing. Other transactions requiring blockchain can be recorded on-chain.

Such architecture allows the platform to record users' comments, votes, chatting and tags on a central server.
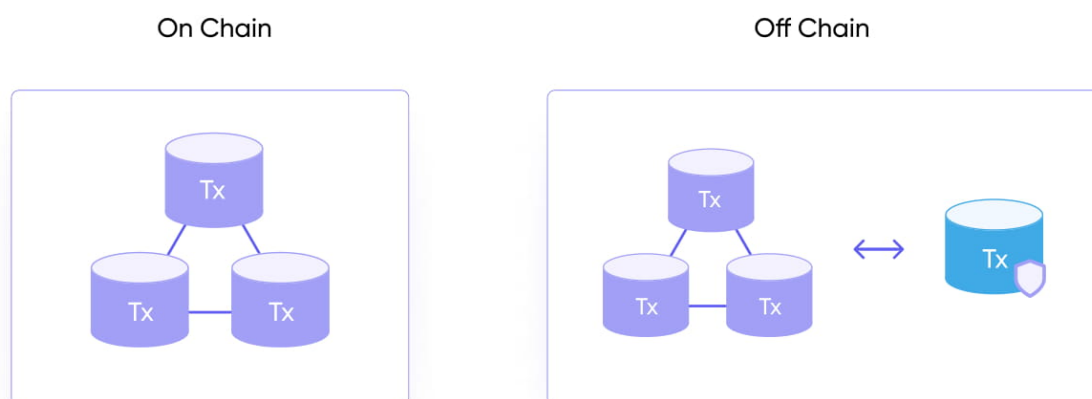
On Chain

Off Chain

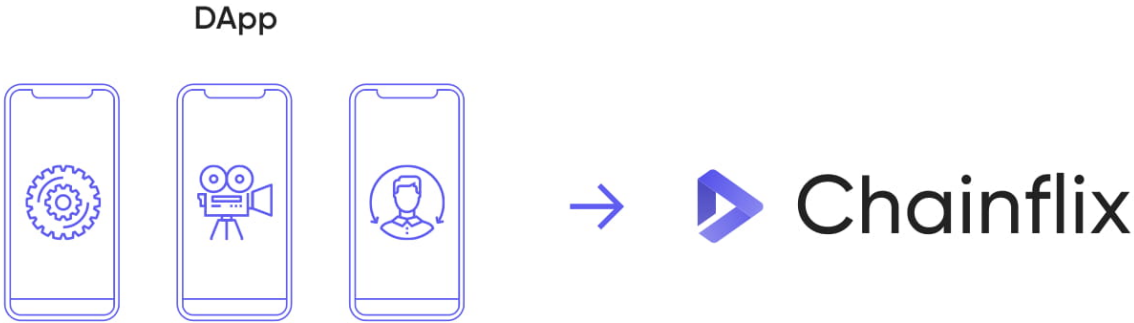Fig. 16. On-Chain and Off-Chain Comparison

DApp

Fig. 17. Chainflix DApp Composition

Chainflix plans to have all kind of Dapps related to our service. For instance, storage provision, advertisement, or production tools are all the different types of Dapps that can exist within the ecosystem.
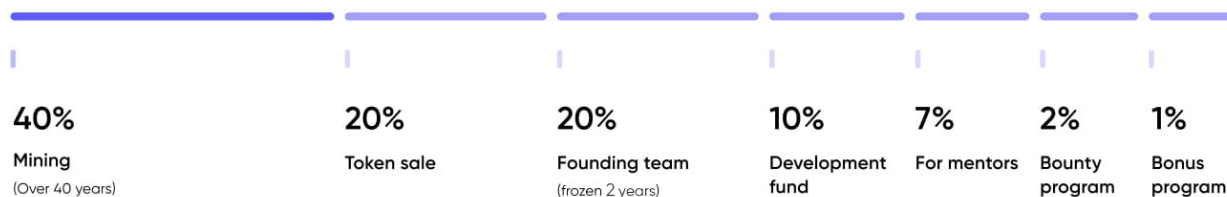
Token

Chainflix

Token Model. Chainflix Token

Chainflix's platform is powered by its native utility coin (CFX). CFX can be acquired from exchanges, bounty/marketing events, or mining. When users watch videos, different ecosystem participants can receive mining rewards depending on the content's mining distribution ratio.

Chainflix's block reward is mined by the patented video playback-based miner. Thus, CFX mined within our native blockchain. Users can convert their mined CFX coins with CFX (Klaytn-based utility token).

SYMBOL	CFX/CFXT
Token Standard	KCT
Block Time	43.2 s
Block Compensation	135 CFX
Half-life	After 2.16 million Block (~1 year) , 67.5 CFX
Pre-mined CFX	3, 000, 000, 000 CFX
Annual Issuance	98, 550, 000 CFX
Annual Issuance after Half-life	49, 275, 000 CFX
Total Issuance after 40 years	**5, 020, 275, 000 CFX**

Chainflix Coin Allocation

40%
Mining
(Over 40 years)

20%
Token sale

20%
Founding team
(frozen 2 years)

10%
Development
fund

7%
For mentors

2%
Bounty
program

1%
Bonus
program

Smart Contract Audit

Chainflix has completed a smart contract audit from a third-party audit company (Slowmist). Our audit completed on, Aug 24, 2020 with the audit number: 0X002008240001.

No	Audit Items	Audit Items	Subclass Result
1	Overflow Audit	-	Passed
2	Race Condition Audit	-	Passed
3	Authority Control Audit	Permission vulnerability audit	Passed
		Excessive auditing authority	Passed
4	Safety Design Audit	Zeppelin module safe use	Passed
		Compiler version security	Passed
		Hard-coded address security	Passed
		Fallback function safe use	Passed
		Show coding security	Passed
		Function return value security	Passed
		Call function security	Passed

No	Audit Items	Audit Items	Subclass Result
5	Denial of Servuce Audit	–	Passed
6	Gas Optimization Audit	–	Passed
7	Design Logic Audit	Permission vulnerability audit	Passed
8	"False Deposit" vulnerability audit	–	Passed
9	Malicious Event Log Audit	–	Passed
10	Scoping and Declarations Audit	–	Passed
11	Replay Attack Audit	ECDSA's signature Replay Audit	Passed
12	Uninitialized Storage Pointers Audit	–	Passed
13	Arithmetic Accuracy Deviation Audit	–	Passed

Roadmap

Roadmap

Chainflix

2018.06

Whitepaper v 1.2
release

2018.10

ChainFlix Website
Launch

2019.01

Distributed Storage
Architecture Design,
PoA Algorithm Development

2019.02

Chainflix Service
Development

2019.03

Chainflix Android
Application Alpha Release

2019.05

Chainflix Android Web,
Alpha Beta Release,
Whitepaper v 1.3 Release

Roadmap

2019.09

Whitepaper v 1.4 Release

2019.11

Chainflix Close Beta

2020.02

Chainflix Open Beta,
Whitepaper v.1.5 Release

2020.03

Whitepaper v.1.6 Release

2020.07

Whitepaper v.1.7 Release

Q2 2021

Chainflix Platform Launch
Official Listing

Roadmap

Q2 2021

Listed Chainflix on the
BitMart Exchange

Q3 2021

Start to develop
livestream feature

Q1 2022

Listed Chainflix on the
LBANK Exchange

Q2-Q3 2022

• Testing Chainflix livestream beta version
• Developed donation feature that
   help supporter can donate to
   their favorite creators

Q4 2022

Launching livestream
beta version officially

Q1 2023

Listing Chainflix to
a new crypto exchange

Roadmap

Chainflix

Q2 2023

Adding ads service

Q3 2023

Launching Chainflix
E-commerce store

Q4 2023

Launching Chainflix
VOD E-commerce service

Q1 2024

Launching Chainflix
Live E-commerce

Team

Chainflix

Jeong-seok Oh
Founder & CEO

The CEO of Jampick, Oh is actively engaging in the blockchain community, providing technical consultations and giving advices all around the world. His stellar career of more than 20 years of experience in the business includes: main architect of coin design and development for a new and renewable energy firm of the U.S.A.; project head for the development of the mobile IT system for Kia Motors of Korea.

Seong-rok Yoon
Senior Engineer

The director of development at Jampick. Yoon is an established expert in the world of game and blockchain. He led the strategic RPG business in 2012 when his game prevailed in 13 countries including the U.S. and Canada. He presently operates a coin-mining pool of more than 900 members. At Jampick, he sits as the mastermind in the development of blockchain core and application software.

Jung-su Park
Blockchain Developer

A blockchain core developer, Park has rich experience in coin-developing and service-launching based on PoA algorithm. He is currently in charge of core development for PoA and PoV based on Klaytn at Jampick.

John Bennet Wiggins

International Business Development Director

Wiggins is an experienced marketing specialist who provided extensive marketing and consulting services for world's renowned companies. Leading a team of program engineers developing patients-specific medical software for hospitals in the U.S.A., he is putting a lot of efforts in the global marketing of Jampick's blockchain business.

Phil-jeon Park

Business Advisor

Park is a well-known marathoner in Korea for his 45 times of the full-course run, some of which was run on bare foot. He is a career specialist in the distribution industry, both in and out of country, currently working as the chairman of Tori International Group.

Chul-young Park

Partnership Advisor

A graduate of the Department of Theater and Film at Dongguk University, Park is an established entrepreneur in the entertainment industry in and out of Korea. He previously ran Miracle Entertainment and the MBC Academy Lifelong Education Center and now works as the CEO of Hollywood Tribute Korea, while serving as the Secretary General of the International Blockchain Promotion Foundation and the Chairman of Seoul Blockchain SME Venture Committee.

Sang-yup Ryu

Financial Advisor

Ryu provides Jampick advices and expertise in blockchain-driven payment and FinTech solutions. He was in charge of the Eco-Service project planning for Samsung Electronics' consumer compensation sales. He also launched a global platform service based on entertainment celebrities' credit card, in cooperation with KBA and MBC of Korea. He is currently engaging in the development of utility coins relating to manufacturers' compensation sales at Blockworld Korea. He has done broadcasting and entertainer card business in cooperation with KBS and MBC as a global platform.
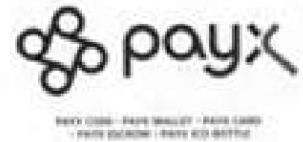
Partners

Partners

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