

# File Sharing Application Based on Blockchain and Distributed Storage

## Team Members

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# Project Background

- **Supportive policy** announced by Chinese Gov with regard to Blockchain technology
- **Coin-free blockchain** in toB & toG track
- Needs of **sharing confidential documents and sensitive data** from organizations (esp. government, military, enterprises)
- **Public or Private chain + Distributed Storage** technology
- **Safe, reliable and traceable data sharing platform** for institutions with high requirements on data security



# Market Potential & Size

## Outlook of current market (Cloud Disk)

1. Personal Cloud Disk: By 2021, the transaction volume of China's personal cloud market is expected to reach **2.4 billion RMB**, up **42%** year on year. And user's needs gradually penetrate into the direction of cross-terminal mobile office, document management collaboration, and personal digital asset storage.
2. Enterprise Cloud Disk: Amazon's cloud CEO said recently that only a small number of companies still use cloud disk services, **accounting for only 4%**.

# Market Potential & Size

## The Domestic Regulatory Principle For the Cloud Industry:

All Chinese data must remain in China and all technical services are expected to be provided by Chinese companies.

- **Competitor:** International mainstream SaaS providers hold low market share and domestic cloud providers Alibaba cloud plus Huawei Cloud hold 55% market share in China.

**End-user demand:** Enterprises, Government and Military need secure file sharing system. Data may be required to be off-cloud fashion.

Therefore, the distributed file sharing system has good market prospect and user size in the future.

# Users' Pain Point

1. Important files be deleted or corrupted and can't be recovered due to employee errors;  
Important files be stolen or maliciously tampered while being shared.
2. need of more secure solution combining with blockchain but still having flexibility
3. Existing cloud resources are too costly.

# Solution



## File Train

A cloud storage service that allows enterprises to share files among their employees with permission control



# Solution

## **Our Solution**

1. Provide public chain based (such as ETD) file sharing system for enterprises.
2. Provide private chain based file sharing system integrating with IPFS for government and military.

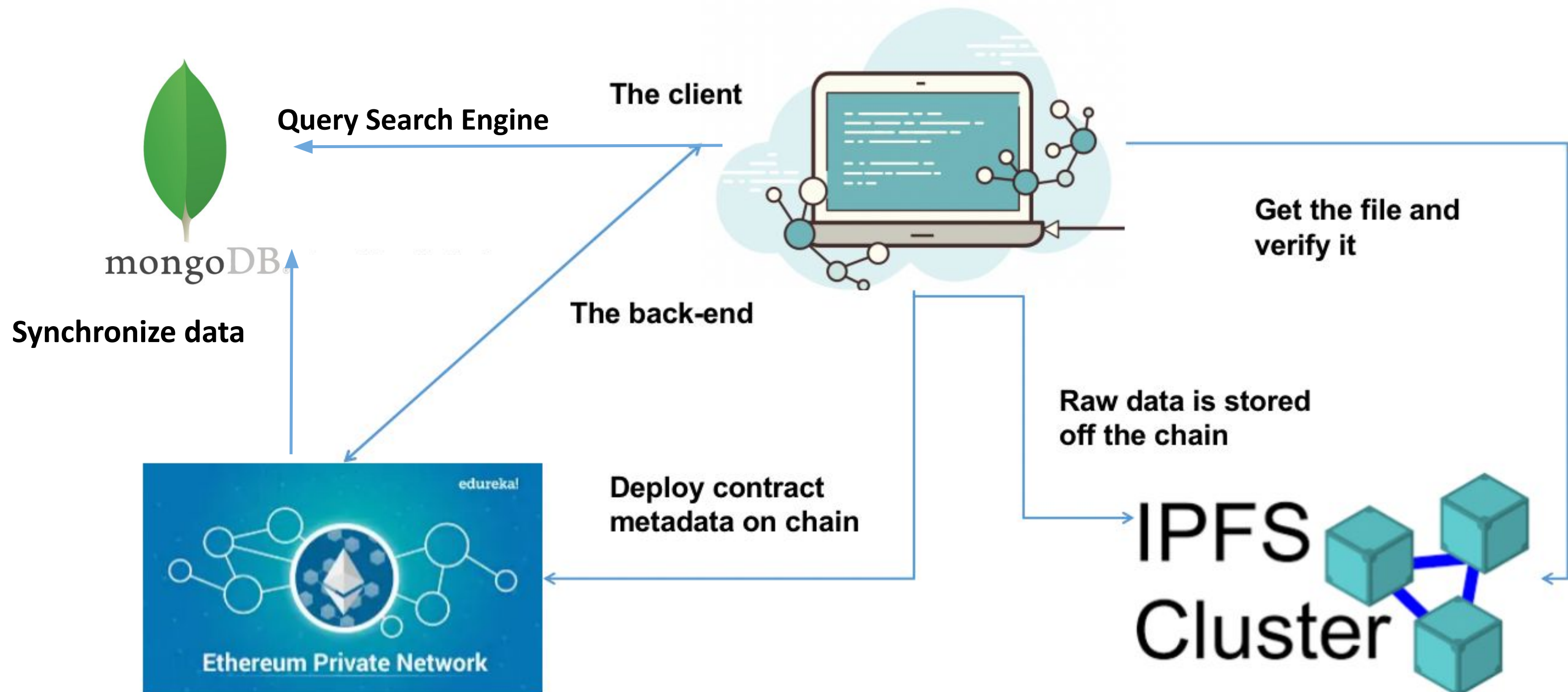
## **Advantages**

1. Blockchain ensures safety, reliability, traceability, and trust
2. Distributed architecture holds good scalability and availability for big data
2. Convenience
3. Low cost



# Solution Architecture

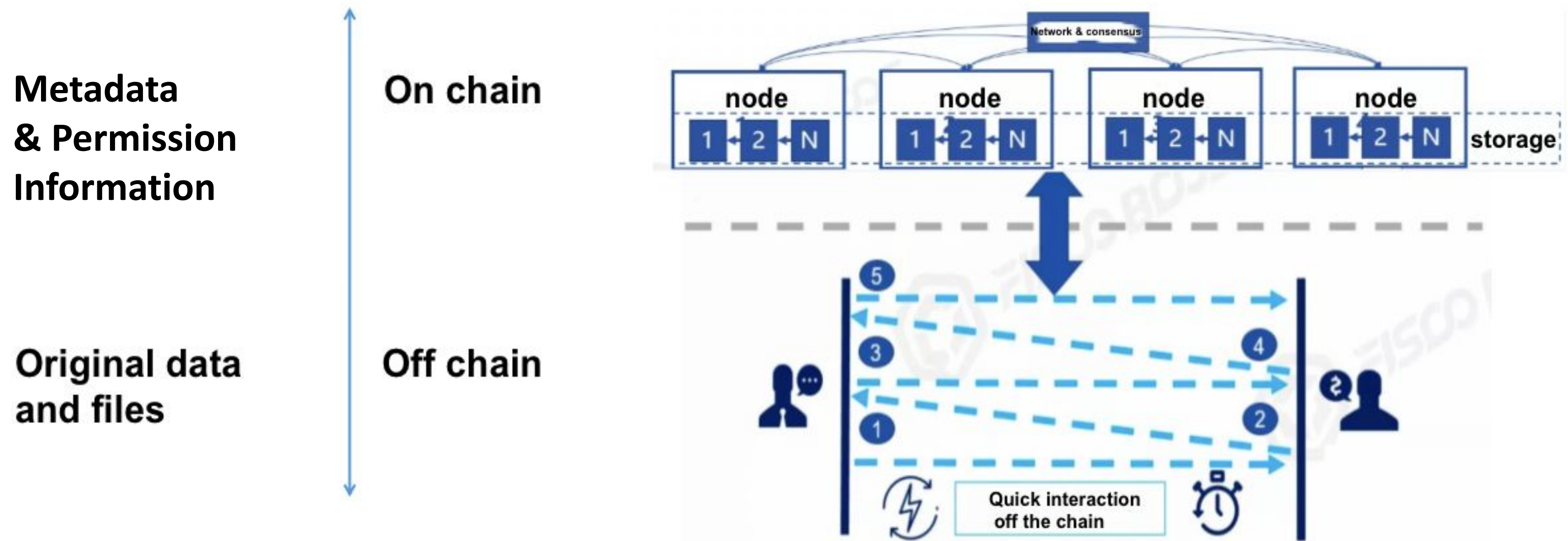
## Solution Architecture Diagram





# On-Chain & Off-Chain Data Storage

## Solution Architecture Diagram



# Solution Working flow

## Upload

1. Upload a file to file storage
2. Encrypt File ID
3. Make NFT for the file
4. Store metadata on the chain
5. Assign permission group for the file
6. Share encrypted FileID to others

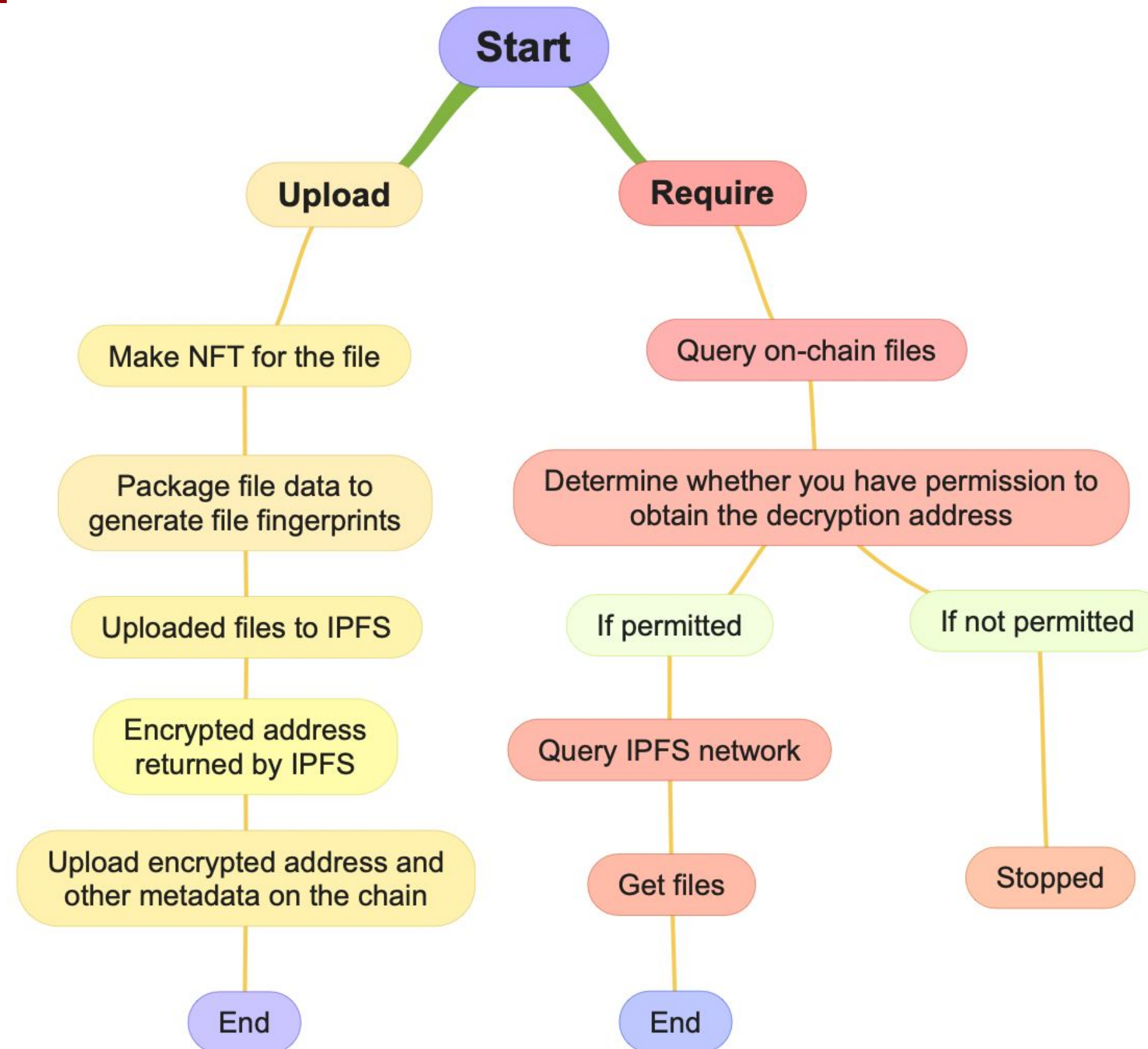
## Download

1. Obtain a file by encrypted File ID
2. Check permission
3. Decrypt File ID
4. Download the file

- The owner of the file will always own the file and the ownership will not be transferred. Each file can be traced back to the sole responsible person.
- FileID returned by the IPFS network or other chain disk is stored in the blockchain as metadata along with the file uploaded. Data on the chain is open, transparent, tamper-proof and traceable to all members.



# Solution Working flow





# App Based on Private Ethereum and IPFS

## Command Line Application

```
(base) zhenyizhu@Zhenyis-MacBook-Pro ~ % minty deploy
deploying contract for token Julep (JLP) to network "localhost"...
deployed contract for token Julep (JLP) to 0x9fE46736679d2D9a65F0992F2272dE9f3c7fa6e0 (network: localhost)
Writing deployment info to minty-deployment.json
(base) zhenyizhu@Zhenyis-MacBook-Pro ~ % minty mint /Users/zhenyizhu/minty/to-the-mo.txt --name "Moon Flight #1" --description "This ticket serves as proof-of-ownership of a first-class seat on a flight to the moon."
-----Copy to MFS Start-----
bafybeicfa3t7djhjzmkxkfmsnnen6xqqjgyw6ksmqtxroxwoogfb27ae2q
-----Copy to MFS Finished-----
🌱 Minted a new NFT:
Token ID: 1
Metadata Address: ipfs://bafybeifgke5gk7t23ufe7nb6xve4xkcbgqe665g2jdrot5dqjttji2qnqu/metadata.json
Metadata Gateway URL: http://localhost:8080/ipfs/bafybeifgke5gk7t23ufe7nb6xve4xkcbgqe665g2jdrot5dqjttji2qnqu/metadata.json
Asset Address: ipfs://bafybeicfa3t7djhjzmkxkfmsnnen6xqqjgyw6ksmqtxroxwoogfb27ae2q/to-the-mo.txt
Asset Gateway URL: http://localhost:8080/ipfs/bafybeicfa3t7djhjzmkxkfmsnnen6xqqjgyw6ksmqtxroxwoogfb27ae2q/to-the-mo.txt
NFT Metadata:
{
  "name": "Moon Flight #1",
  "description": "This ticket serves as proof-of-ownership of a first-class seat on a flight to the moon.",
  "image": "R5s+wwuv//caypqAK+8nR1xqBe3wY1So50lenNZH11su/ruL2rcp+6MQhKS1etGjZBQa/HxYvHdzKgtk3BxSVVWtq3cqY0LxRZIOErdAfXaIuXEiy9IkVpBdP8rmy63WguEEZGG17EB5tDw+sbs7U1o38SgcK+Gxzq+kFyvT1I="
}
(base) zhenyizhu@Zhenyis-MacBook-Pro ~ %
```



# Application Based on ETD



YOUR ACCOUNT: 0X157150A7AA199472EA6D803AC91D3EDD30A8E659



Enter Encrypted FileID

DOWNLOAD



No file selected

Permission Group ID [UPLOAD](#)

< 1 >

ID	Name	Size	Type	Created At	FID
0	HKUST-BDT.png	786495	image/png	Wed May 04 2022 23:49:22 GMT+0800	⋮
1	test.png	11462	image/png	Thu May 05 2022 00:03:13 GMT+0800	
2	core-site.xml	7396	text/xml	Thu May 05 2022 00:09:01 GMT+0800	

- ✉ Send Email
- 👁 View Encrypted FID
- 🗑 Delete File
- 📄 Download File



Recents



Favorites



Notification

# Application Based on ETD

Group1: 0x157...

Group2: 0x930...

Group3: 0xfc0..., 0x157...

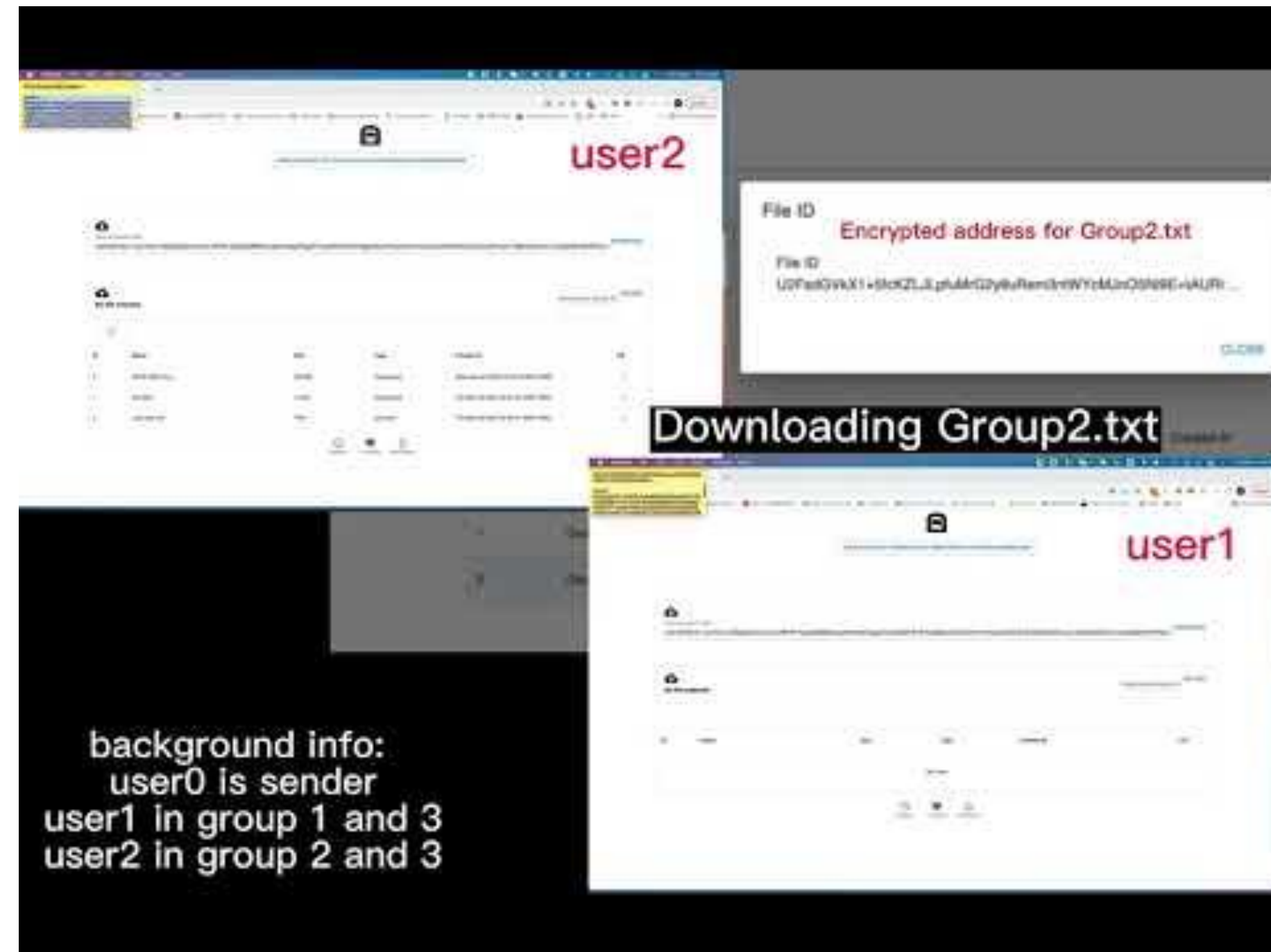
...

File Owner: 0x6b

Group1.txt with permission group 1

Group2.txt with permission group 2

Group3.png with permission group 3

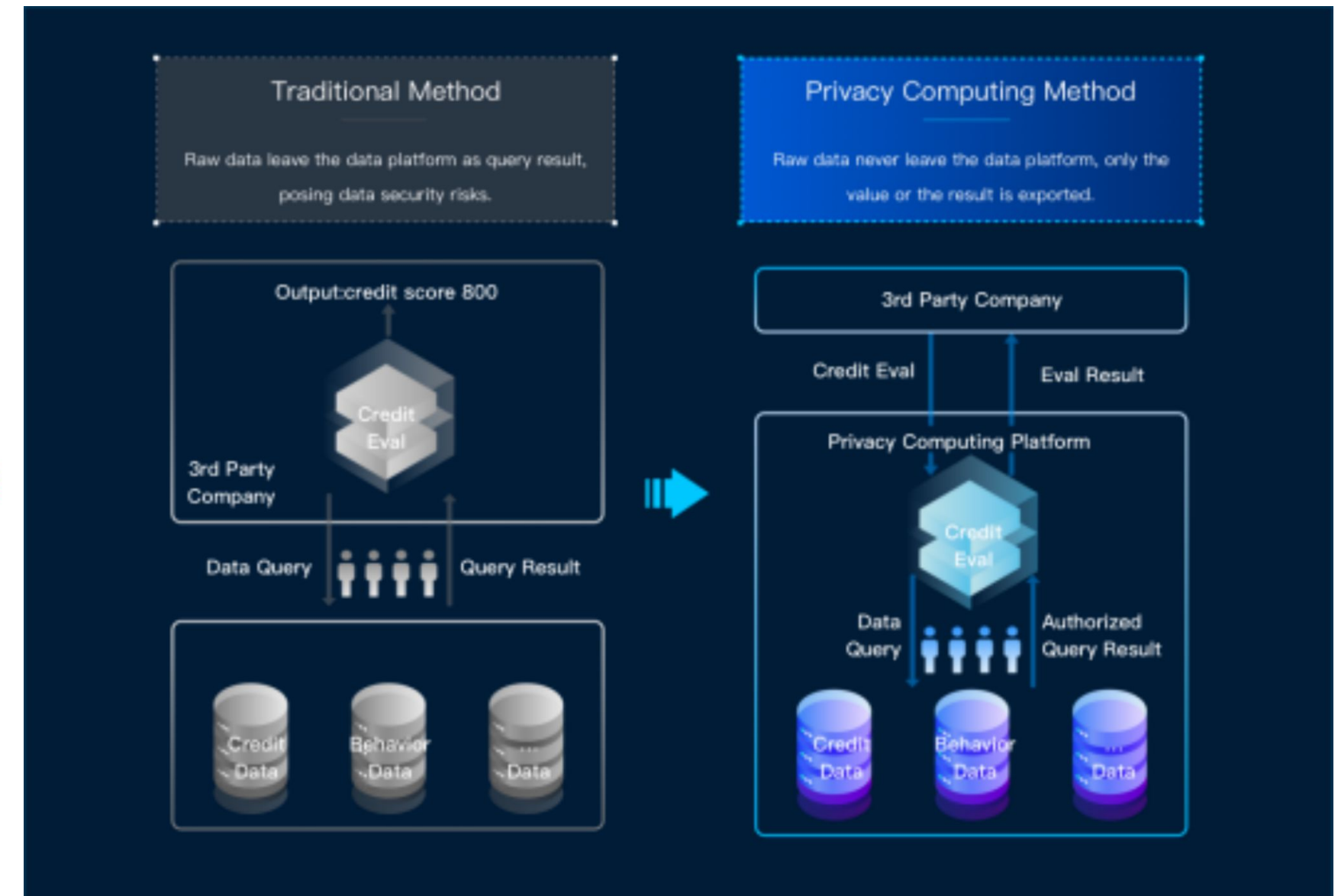
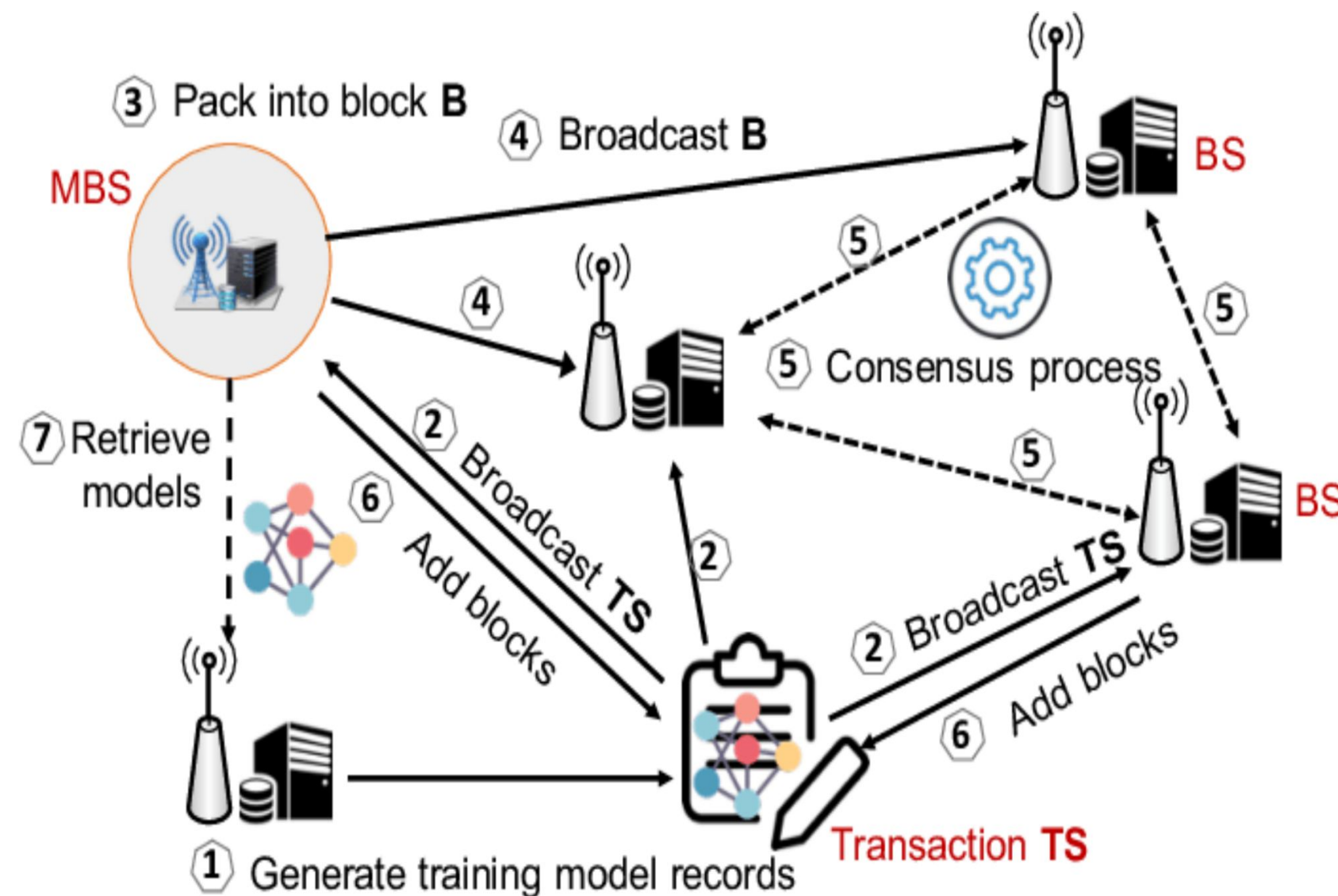


Link: <https://file-train-8plqcr1yf-block-chain-file-train-project.vercel.app/>



# Future Technology Track Plan

- Expand to federal learning with privacy computing
- Enable the secure computation of the data without revealing the content of the data



# Future Business Track Plan

- Write whitepaper later
- Set up business roadmap
- Establish association :

## **Chinese market**

Connect with government, enterprises and military and let them use

## **Overseas market**

Use Discord, Telegram to attract people to join our ecosystem; Hire Twitter influencer blogger to promote; Convince cryptocurrency kingpins to invest and use.



**Thanks for Watching**