DTube

A decentralized Youtube clone

A Blockchain Application

Under the guidance of

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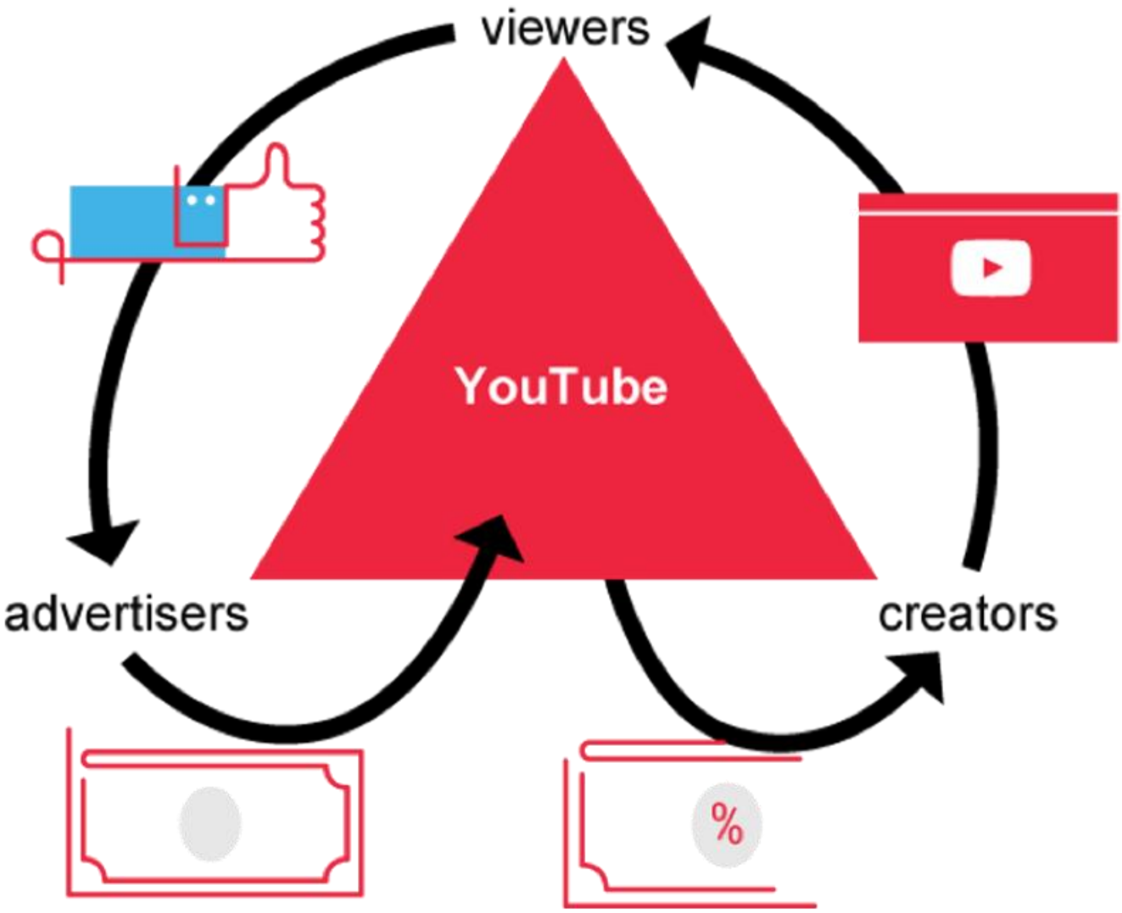
Introduction

How most video sites works?

YouTube, along with almost every other streaming video website, is a centralized service. For most people, this isn't a problem. Video content uploads to YouTube's servers and is searchable through YouTube's search function. Then, the content streams to devices in whatever format YouTube thinks is best.

This way of working is not without its merits. A centralized service provides the same content to all. Some say, however, that centralized services are a problem.

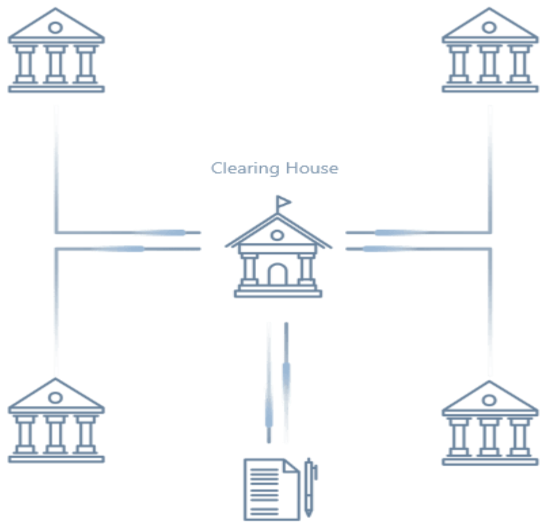


Problem and Necessity of solution

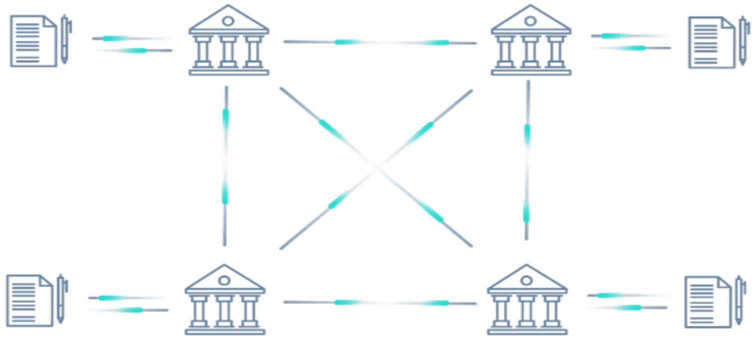
Since all storage for video content is on YouTube's servers, users ultimately have no control over what happens to their videos. YouTube decides what should be on their platform, not YouTube users. If you want to make money from your videos through advertising, YouTube is the broker which decides what is fair to monetize and what isn't.

YouTube's algorithm is supposed to promote content fairly, but some content creators notice **discrepancies in this system, allegedly making some channels disappear overnight.**

In this way, centralized video could be a bad idea.



Centralised Ledger



Decentralised Ledger

Brief view on DTube

DTube is a decentralized video service that exists on a blockchain rather than a central server. Creators can use the service knowing that their data is safe.

DTube has no central servers. All of the content is stored on a blockchain. By nature, a blockchain's data is verified between all of its members.

This is an example of Distributed Hash Tables (DHT) and works similarly to peer-to-peer torrenting of information. Consequently, there is no one definitive video file in one place, more a shared agreement of what the video file contains.

This makes it difficult, if not impossible, to tamper with video content on DTube. It is not the only online app looking into this kind of secure operation. If you've ever asked yourself whether a truly decentralized internet is possible, DTube is an example of it at work.

Decentralized videos mean there's no simple way of removing content from the site. This could be a blessing or a curse. For some users, however, the assurance that their content is not in the hands of a large organization is a big draw, and a reason to switch to DTube.

TechStack

IPFS

IPFS stands for Interplanetary File System. At its core it is a versioned file system which can store files and track versions over time, very much like Git. It also defines how files move across a network, making it a distributed file system, much like BitTorrent. In combining these two properties, IPFS enables a new permanent web and augments the way we use existing internet protocols like HTTP

Ganache

Ganache is a high-end development tool used to run your own local blockchain for both Ethereum and Corda dApp development. Ganache is helpful in all parts of the development process. The local chain allows you to develop, deploy and test your projects and smart contracts in a deterministic and safe environment.

Metamask

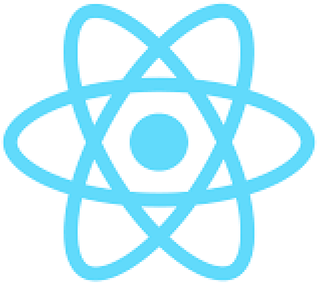
MetaMask (which, like an editorially independent Decrypt, is funded by Ethereum incubator ConsenSys) is a browser plugin that serves as an Ethereum wallet, and is installed like any regular plugin. Once it's installed, it allows users to store Ether and other ERC-20 tokens, enabling them to make transactions to any Ethereum address.

By connecting to Ethereum-based Dapps, users can spend their coins in games, stake tokens in gambling applications and trade them on decentralized exchanges. It also provides users with an entry point into the emerging world of decentralized finance, or DeFi, providing a way to access DeFi apps such as Compound and PoolTogether.

Truffle

Truffle is the most popular development tooling for Ethereum programmers. Easily deploy smart contracts and communicate with their underlying state without heavy client side programming. An especially useful library for the testing and iteration of Ethereum smart contracts.

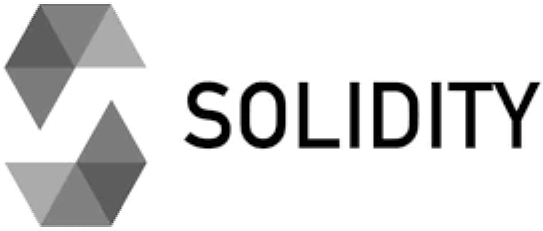
React for UI



The web application is developed with ReactJS with Web3 to build a React dapp that can be used in a browser with injected web3, such as when using MetaMask. Web3.js is a JavaScript library that allows us to communicate with the Ethereum blockchain. It connects users to MetaMask or any wallet from the UI and turns our React application into a blockchain enabled application.

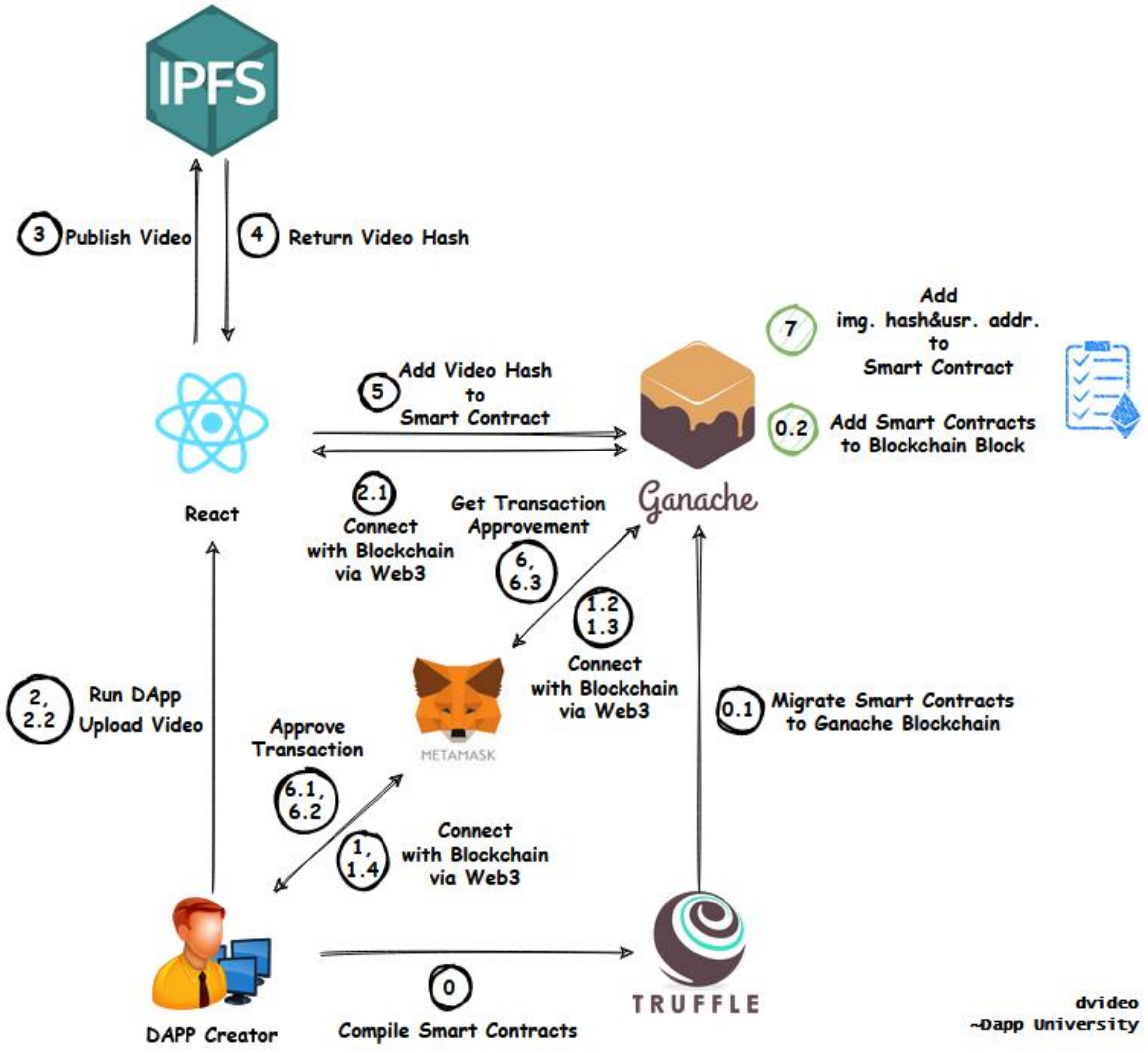
Once we run the React application in the browser, it will trigger Metamask to interact with your blockchain network.

Solidity



Solidity is an object-oriented programming language for writing smart contracts. It is used for implementing smart contracts. It is a Javascript-like language developed specifically for writing smart contracts. Solidity is statically typed, supports inheritance, libraries and complex user-defined types among other features. The solidity compiler turns code into EVM bytecode, which can then be sent to the Ethereum network as a deployment transaction. Such deployments have more substantial transaction fees than smart contract interactions and must be paid by the owner of the contract.

Workflow


IPFS
3 Publish Video
4 Return Video Hash
React
5 Add Video Hash to Smart Contract
2.1 Connect with Blockchain via Web3
Get Transaction Approvement
6, 6.3
Ganache
7 Add img. hash&usr. addr. to Smart Contract
0.2 Add Smart Contracts to Blockchain Block
1.2 1.3 Connect with Blockchain via Web3
METAMASK
0.1 Migrate Smart Contracts to Ganache Blockchain
2, 2.2 Run DApp Upload Video
Approve Transaction
6.1, 6.2
1, 1.4 Connect with Blockchain via Web3
DAPP Creator
0 Compile Smart Contracts
TRUFFLE
dvideo
~Dapp University

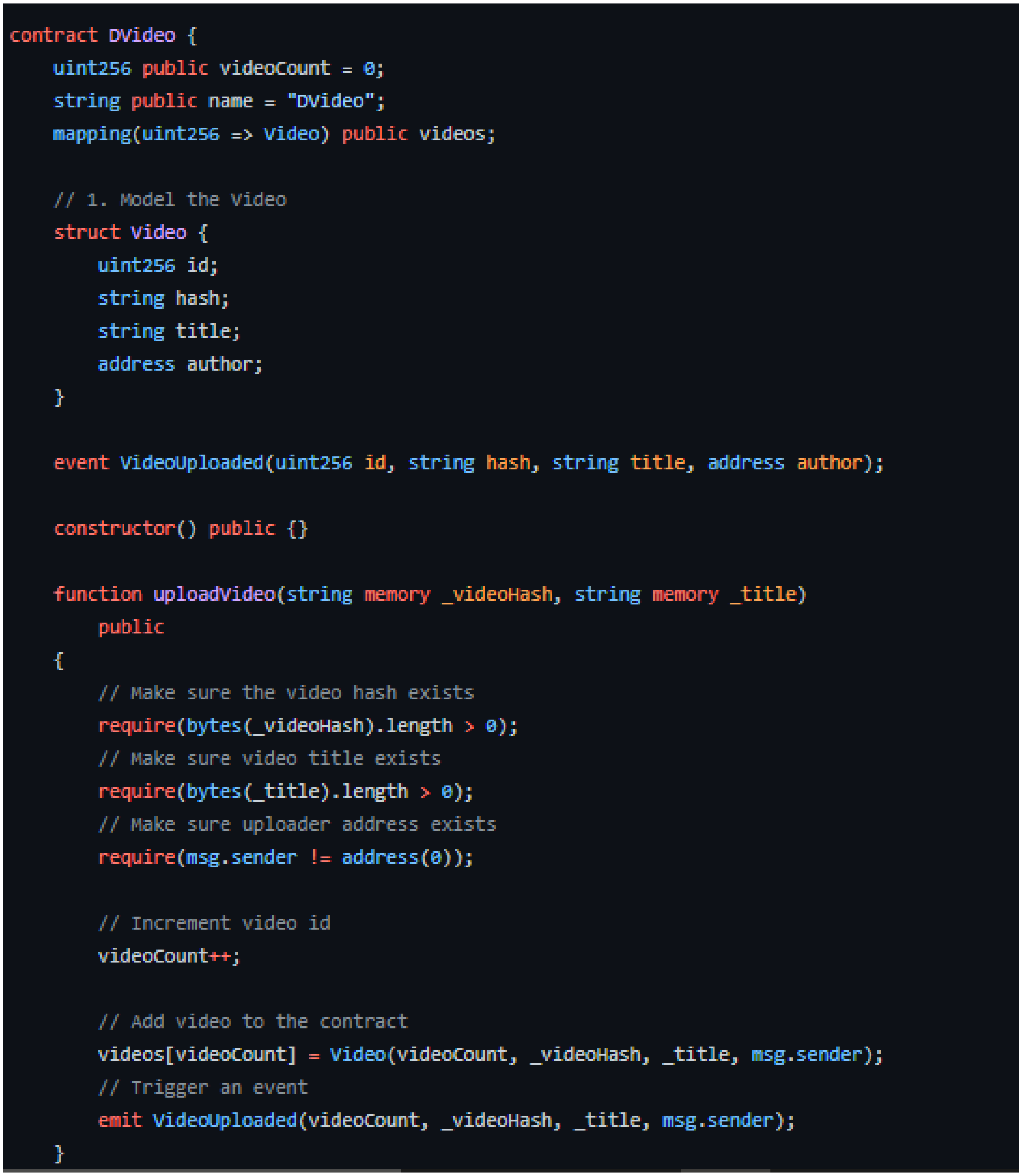
Contracts

1. Model the Video

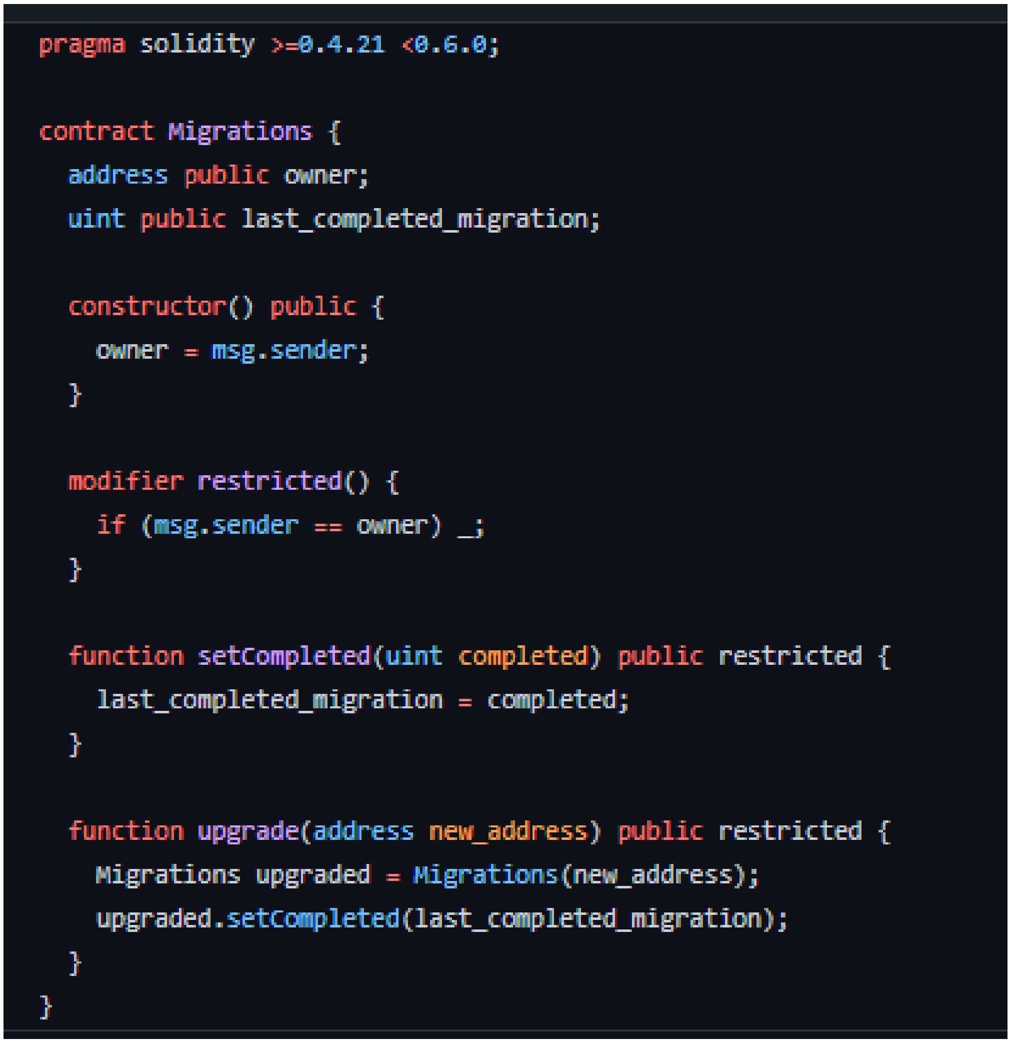
2. Store the Video

3. Upload Video

4. List Videos



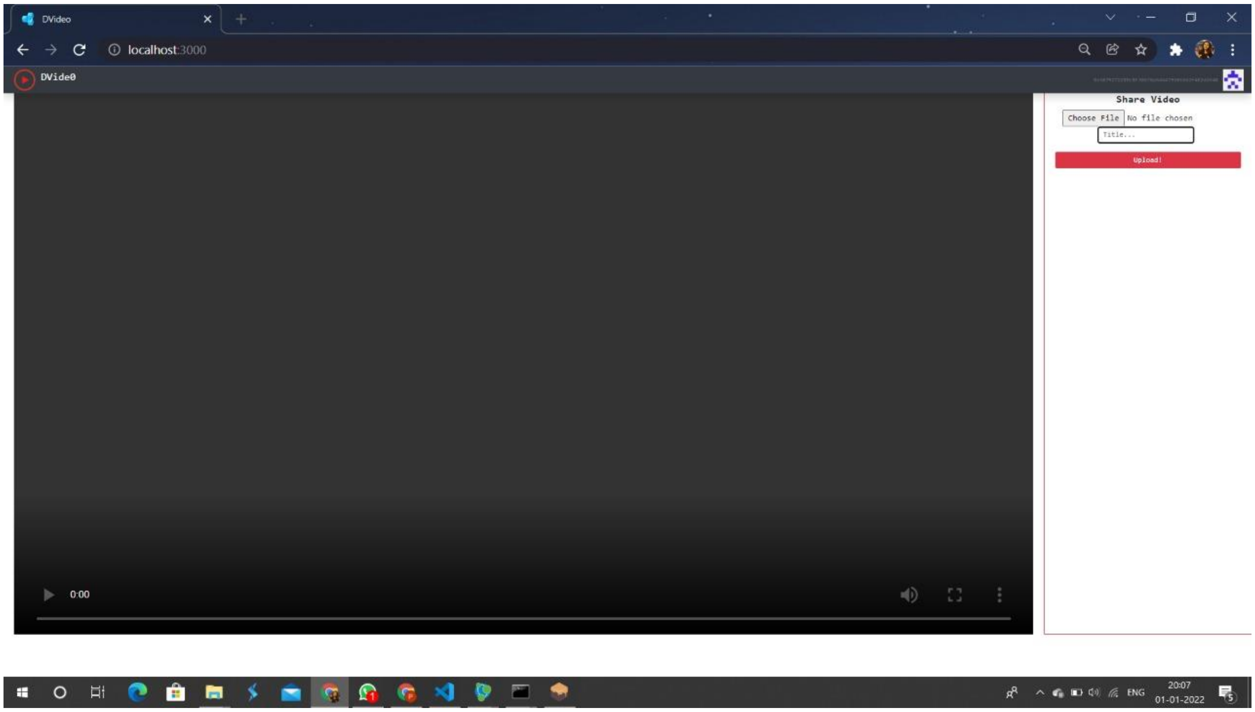
```
contract DVideo {
    uint256 public videoCount = 0;
    string public name = "DVideo";
    mapping(uint256 => Video) public videos;

    // 1. Model the Video
    struct Video {
        uint256 id;
        string hash;
        string title;
        address author;
    }

    event VideoUploaded(uint256 id, string hash, string title, address author);

    constructor() public {}

    function uploadVideo(string memory _videoHash, string memory _title)
        public
    {
        // Make sure the video hash exists
        require(bytes(_videoHash).length > 0);
        // Make sure video title exists
        require(bytes(_title).length > 0);
        // Make sure uploader address exists
        require(msg.sender != address(0));

        // Increment video id
        videoCount++;

        // Add video to the contract
        videos[videoCount] = Video(videoCount, _videoHash, _title, msg.sender);
        // Trigger an event
        emit VideoUploaded(videoCount, _videoHash, _title, msg.sender);
    }
```



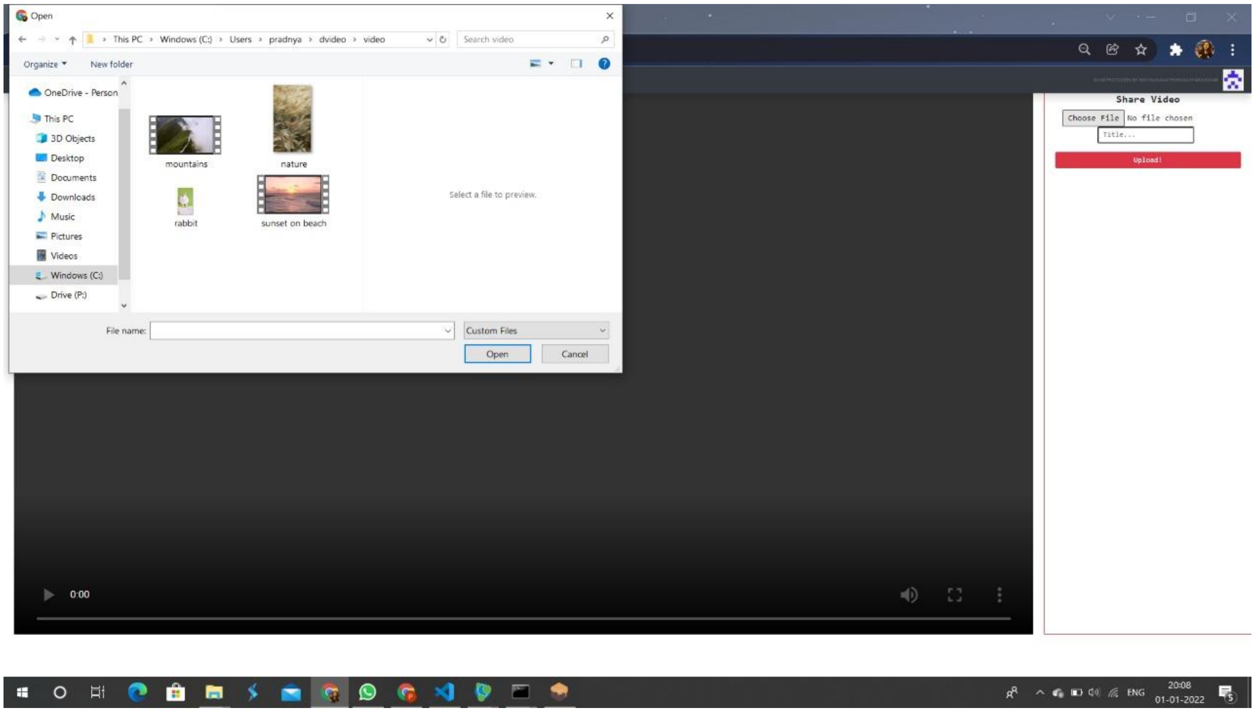
```
pragma solidity >=0.4.21 <0.6.0;

contract Migrations {
  address public owner;
  uint public last_completed_migration;

  constructor() public {
    owner = msg.sender;
  }

  modifier restricted() {
    if (msg.sender == owner) _;
  }

  function setCompleted(uint completed) public restricted {
    last_completed_migration = completed;
  }

  function upgrade(address new_address) public restricted {
    Migrations upgraded = Migrations(new_address);
    upgraded.setCompleted(last_completed_migration);
  }
}
```

Output

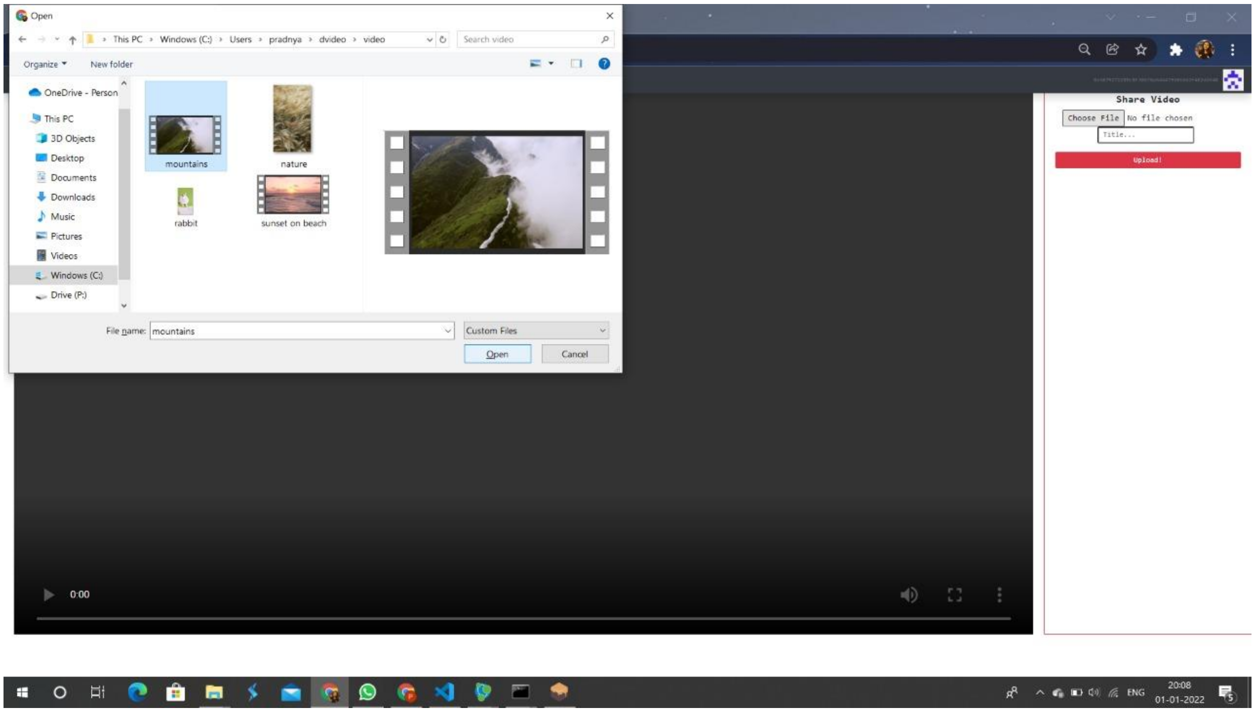
1. UI for uploading videos



2. Click on upload. A window appears.



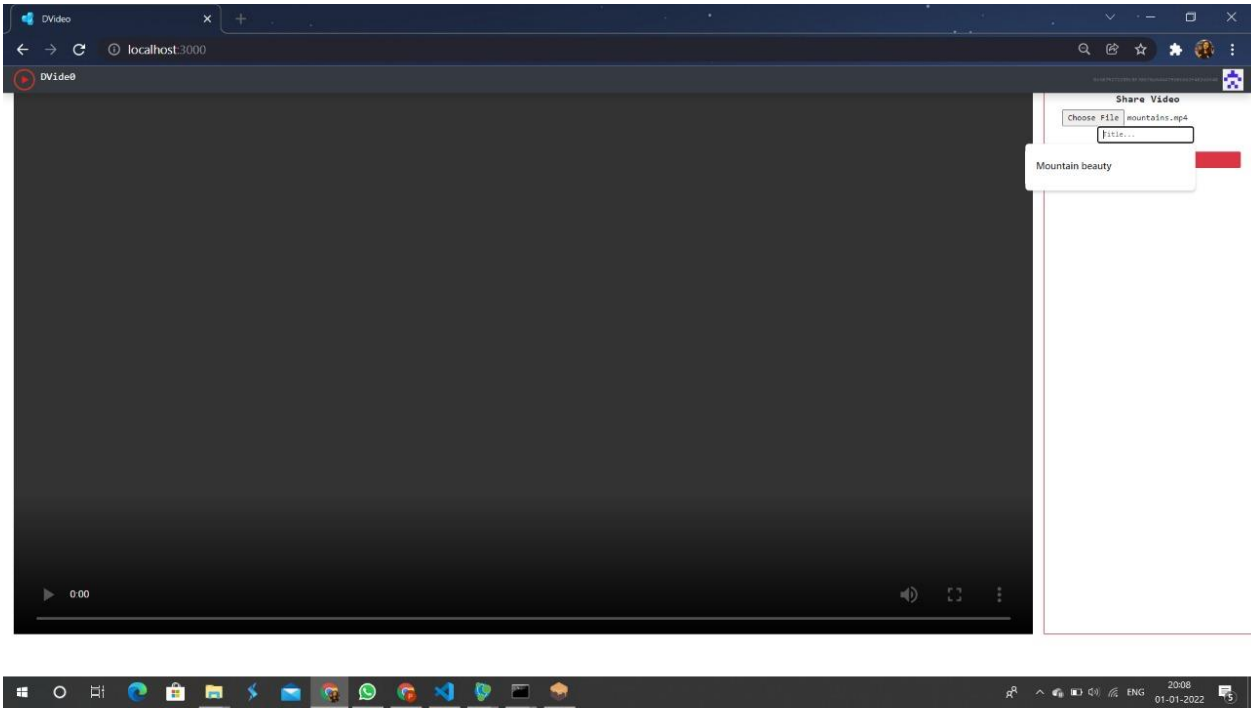
3. Select the video.



File name: mountains

No file chosen

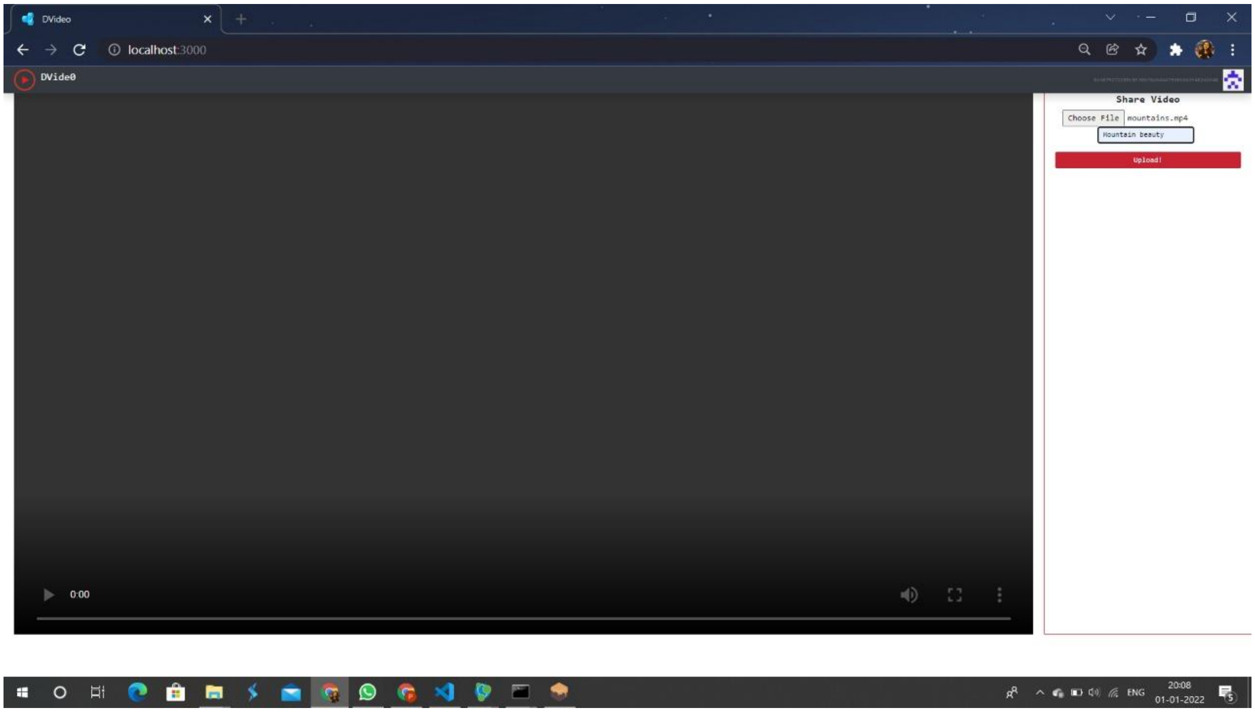
4. Add a title.



mountains.mp4

Mountain beauty

5. Click on upload.

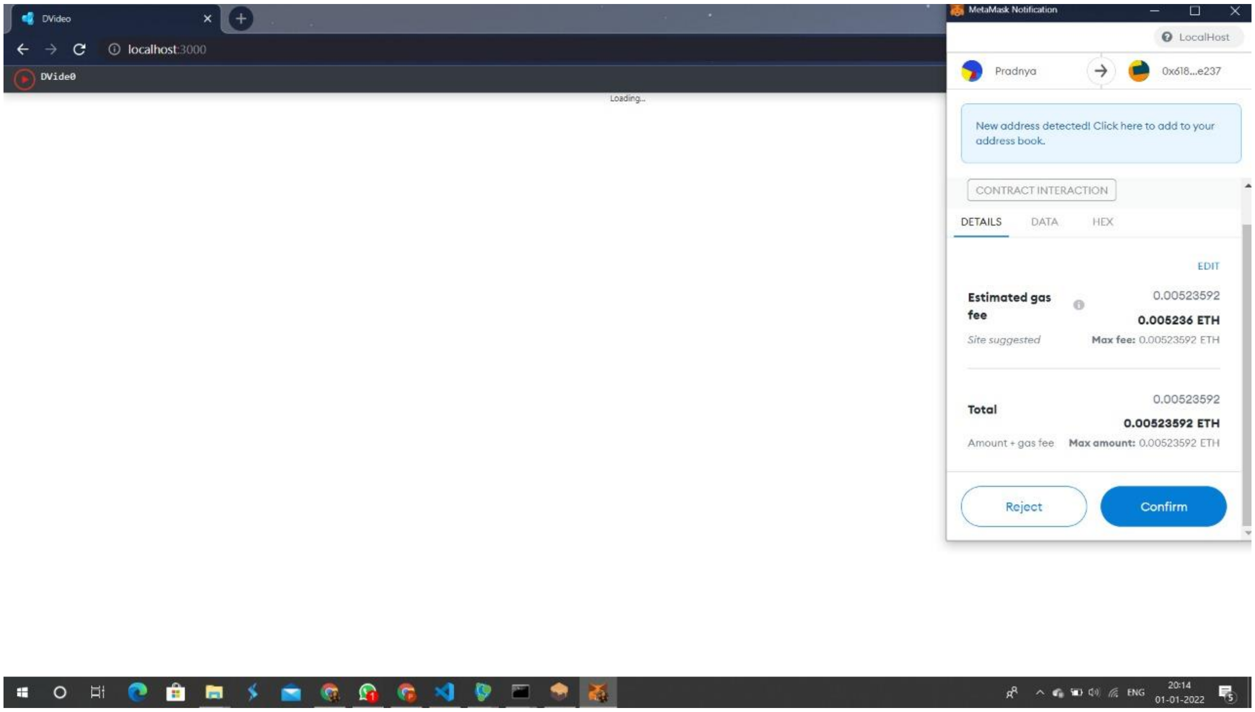


Share Video

Choose File mountains.mp4

Mountain beauty

Upload!



Pradnya → 0x618...e237

New address detected! Click here to add to your address book.

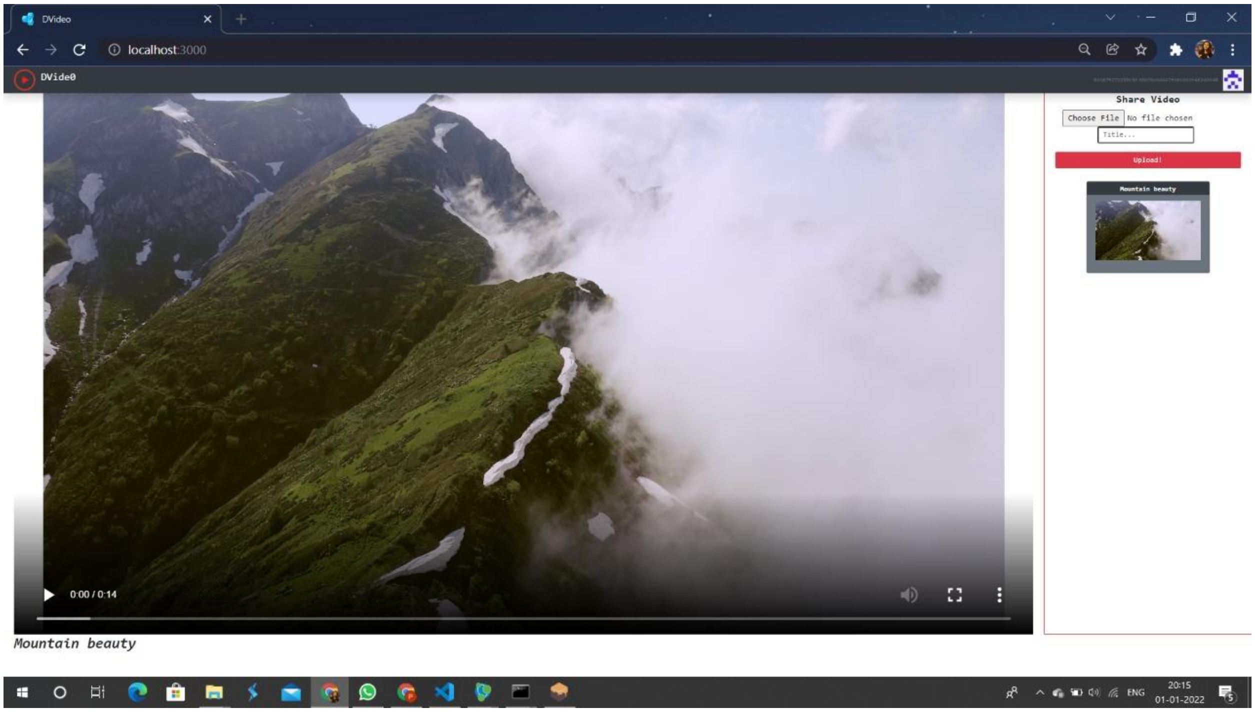
Estimated gas fee 0.00523592 **0.005236 ETH**

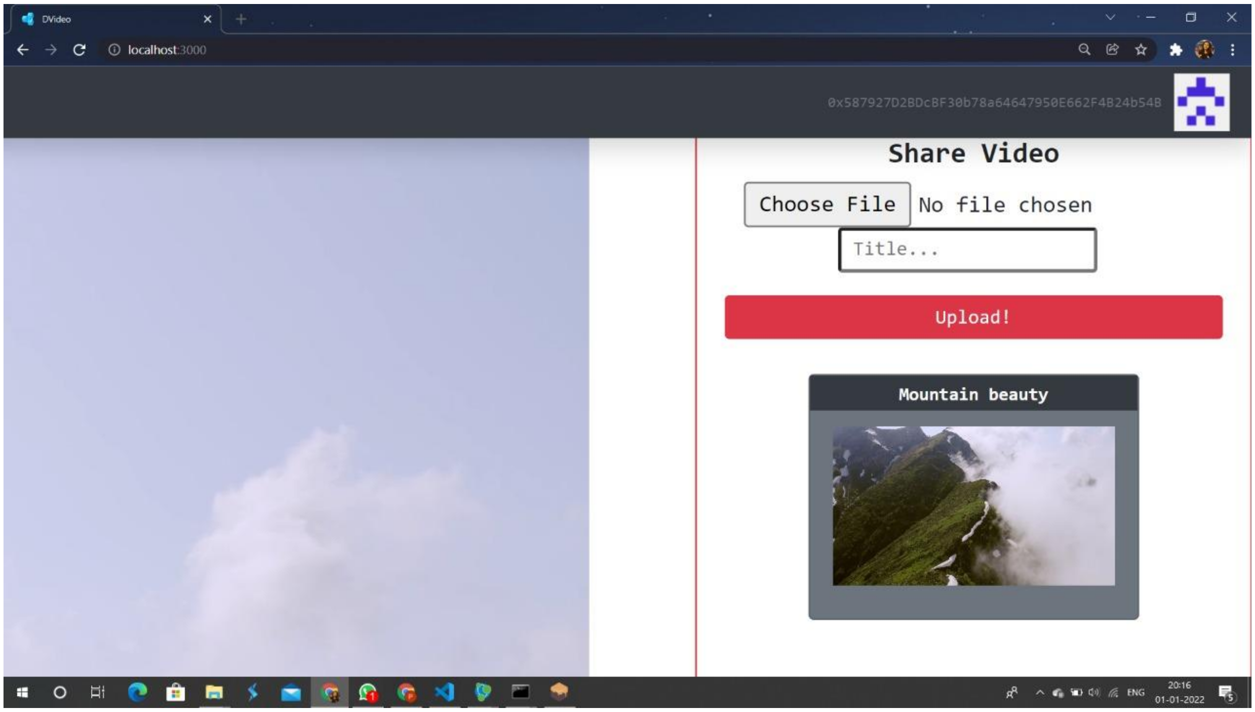
Site suggested **Max fee:** 0.00523592 ETH

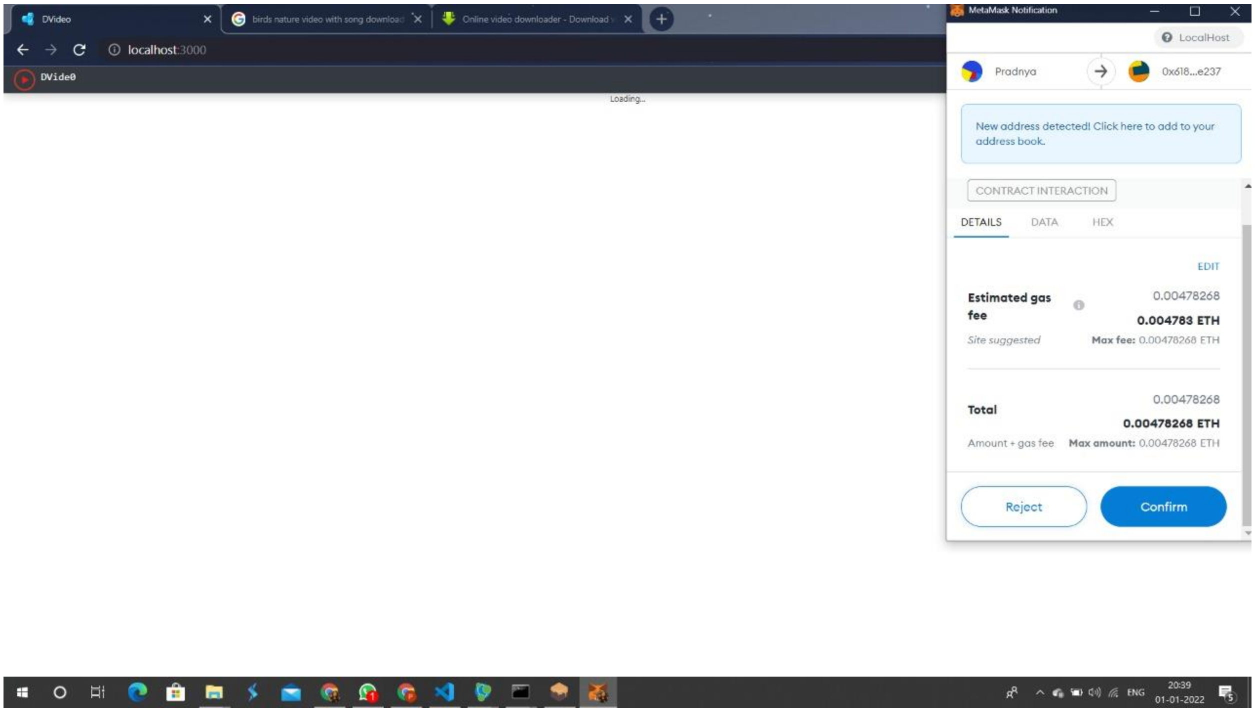
Total 0.00523592 **0.00523592 ETH**

Amount + gas fee **Max amount:** 0.00523592 ETH

6. Video is uploaded successfully.





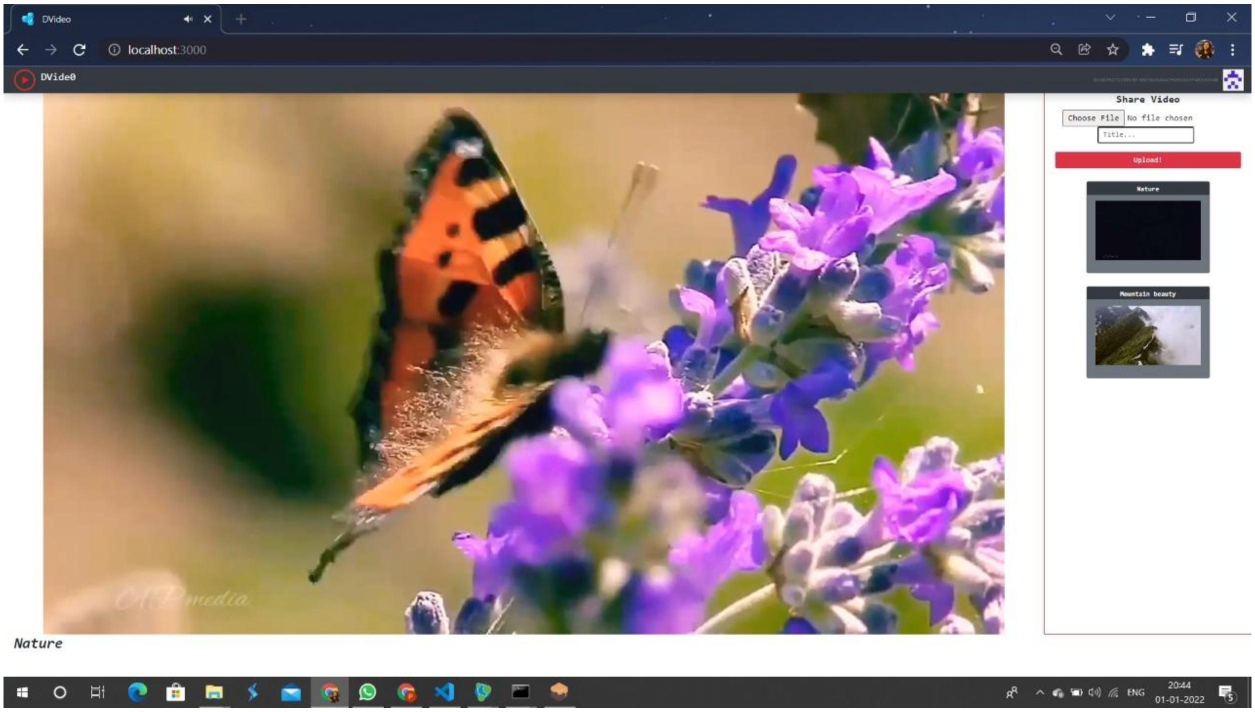


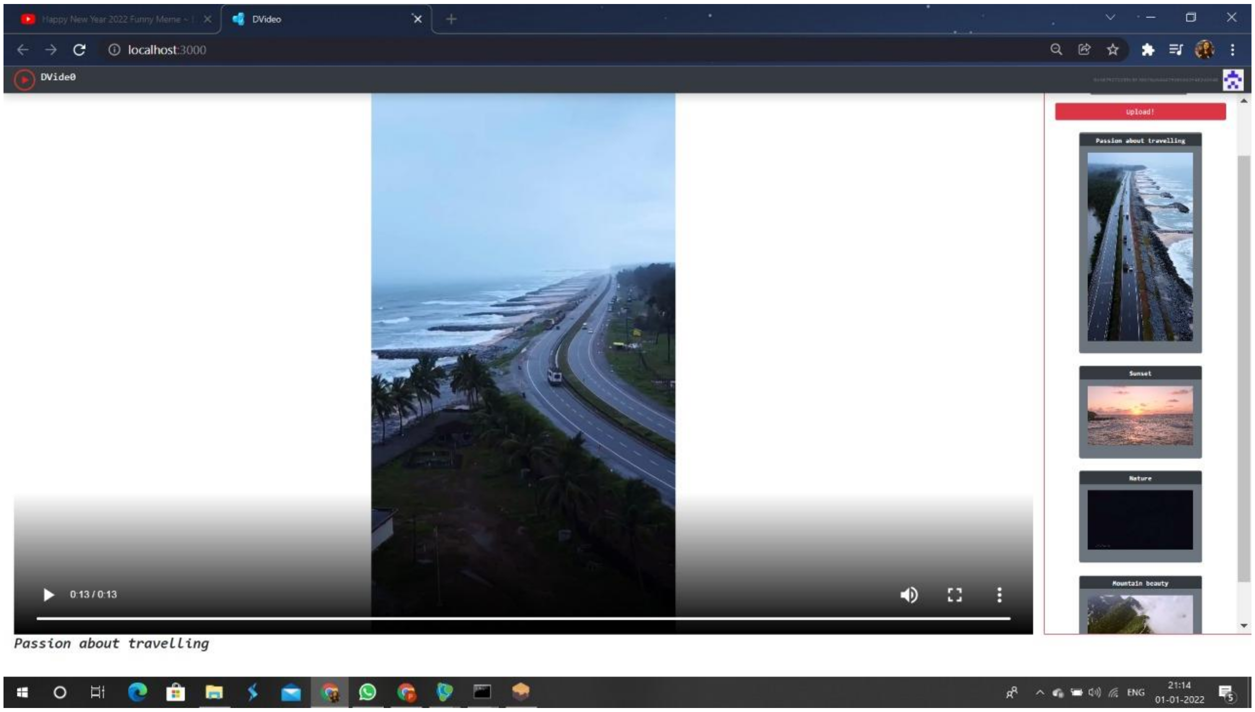
New address detected! Click here to add to your address book.

Estimated gas fee 0.00478268
0.004783 ETH
Site suggested Max fee: 0.00478268 ETH

Total 0.00478268
0.00478268 ETH
Amount + gas fee Max amount: 0.00478268 ETH

7. List of videos can be seen on right hand side.




Happy New Year 2022 Funny Meme -
DVideo
localhost:3000
DVide0
Upload!
Passion about travelling
Sunset
Nature
Mountain beauty
0:13 / 0:13
Passion about travelling
ENG
21:14
01-01-2022

Conclusion

In this way, a decentralized youtube system is created. This is an example of Distributed Hash Tables (DHT) and works similarly to peer-to-peer torrenting of information. Consequently, there is no one definitive video file in one place, more a shared agreement of what the video file contains.

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