COOLMINT

Easy-Minting Discord Bot

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***Abstract*—It is difficult for NFT creators to mint NFTs without developers and to manage data. NFT buyers have to get information across multiple platforms, and information search, community activities, and NFT purchases are done in different platforms. Therefore, this study developed a Discord bot ”COOLMINT” that can mint NFT with no-code and increase the convenience of data management and accessibility of information. We plan to develop a new NFT platform as future work.**

***Index Terms*—NFT, creator, community, Discord bot**

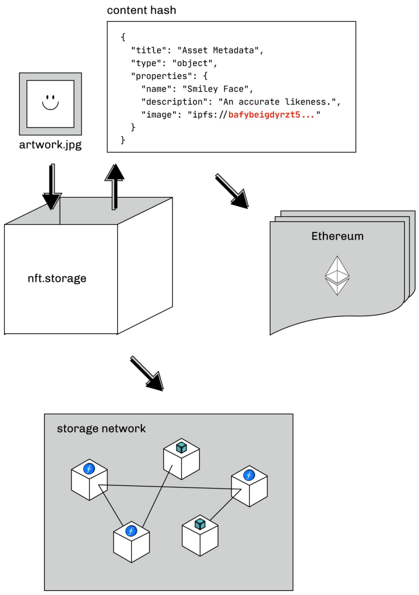
I. Introduction

NFT is a non-fungible token, and many NFTs have been actively traded recently. However, as it is still an early market, accessibility and availability are poor for both NFT creators and NFT buyers. In particular, NFT creators cannot be fully paid for their creations because blockchain developers are essential to mint NFTs. In addition, Discord, which is most widely used as the NFT community, is difficult to conveniently manage data about NFT projects. Furthermore, NFT buyers cannot easily and quickly find information about NFT projects such as minting dates, prices, and the conditions for pre-purchasers(white list) and original gangster(early members), and they can find information and purchase NFTs across multiple platforms. Therefore, in this study, we developed a Discord bot ”COOLMINT” that allows creators to mint NFT easily without developers, buyers to easily access minting information, and even purchase. Discord is a platform used by the majority of NFT communities so we expect more NFT projects to be launched using COOLMINT bot. In addition, in order to improve the inconvenient UI/UX of the Discord and to add more functions, we plan to develop a new NFT platform as future work.

II. Technical Background

A. NFT Minting

NFT is ”Non-fungible Token” that cannot be changed on the blockchain network. To publish an NFT to Ethereum network, we have to mint the NFT using Ethereum smart contract. The transaction contract of the NFT(minting) is written on the Ethereum chain, and stored permanently.



```
{
  "title": "Asset Metadata",
  "type": "object",
  "properties": {
    "name": "Smiley Face",
    "description": "An accurate likeness.",
    "image": "ipfs://bafybeigdyrzt5..."
  }
}
```

Fig. 1. Minting system

When we mint NFT, the contract of the transaction is written on the Ethereum chain, and the the data(content) of the NFT is also stored. However, we do not store the actual image file in the content. We store the image URI in it and the actual image file is stored in IPFS.

B. IPFS

IPFS is the InterPlanetary File System that can store data in a distributed manner. It is peer-to-peer network and uses content-addressing to uniquely identify each file in a global namespace connecting all computing devices. [1]

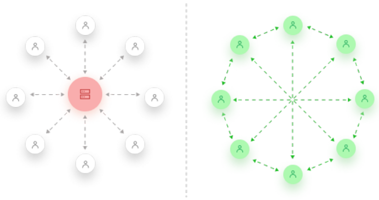


Fig. 2. HTTP vs IPFS

III. Methodology

A. Overview

COOLMINT is an easy-minting Discord bot. COOLMINT bot runs on top of Discord, which is one of the most widely used social application in blockchain, NFT area. Discord bots are simple. They receive a predefined command by chat with a prefix and returns a predefined action by chat. When commands are received Coolmint bot returns Discord buttons for further actions. Buttons provide an outlink to COOLMINT's web page where further actions such as wallet connection, contract deploy, NFT minting can be done.

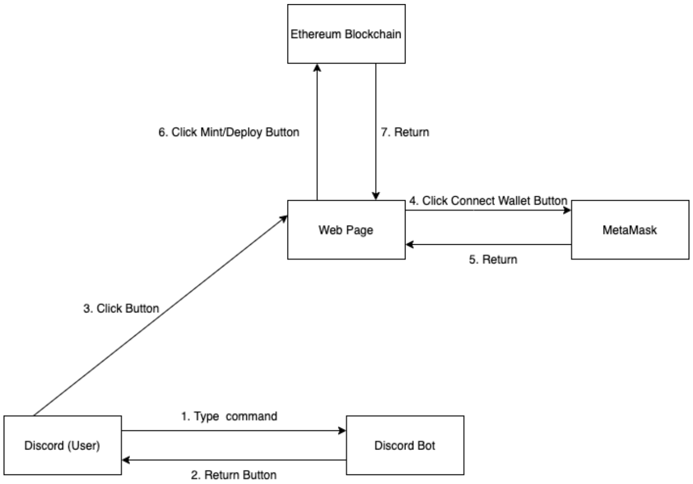


Fig. 3. Flowchart of COOLMINT

B. Discord Bot

COOLMINT Discord bot is developed with python with discord.py library. The Python code runs as a server listening for commands from the Discord channels that has added COOLMINT bot to their channel. To provide each channel with their own web page with a single code, COOLMINT uses Discord channel id as an identifier. By using this id, COOLMINT provides each channel with their own customized smart contract and minting page where users in their channel can exclusively mint their NFTs.

C. Web Page

When the buttons are clicked, buyers and creators are redirected to COOLMINT's web page. COOLMINT created their own web page since the bot is run on Discord, all the functionality could only be provided in a restricted way, thus the flexibility of UI/UX was the worst.

COOLMINT's web page is built with javascript only, using React.js framework. There are two pages, one for the buyers and the other for the creators. On both pages, users can only access the functionalities provided with their wallets connected. Wallet connection is supported only with Metamask wallets by clicking on the connect wallet button on the top right corner. On the buyers' page, buyers can check the amount of NFTs left and the amount of NFTs they have bought. Buyers can type in the amount of NFTs they want to purchase and click on the mint button to get minted. Then a pop up for signature shows up calling the mintToken function in the minting contract with the total mint price and gas fee added. On the creators' page, creators can name their project name, decide symbol for the project, choose the amount of NFTs to supply, choose the starting date of the sale and the price for each NFT. After all the values are put, creator can click the deploy button to deploy the minting contract. The popup for signing will show up with the gas fee to deploy the contract.

All the functionalities on the web page are developed with web3.js package. web3.eth.Contract module helps bring smart contract as an object and from the object, contract functions can be referenced by referencing with methods. window.ethereum.request with eth_requestAccounts method provided by web3.js package allows users to connect their Metamask wallet on the browser.

D. Smart Contract

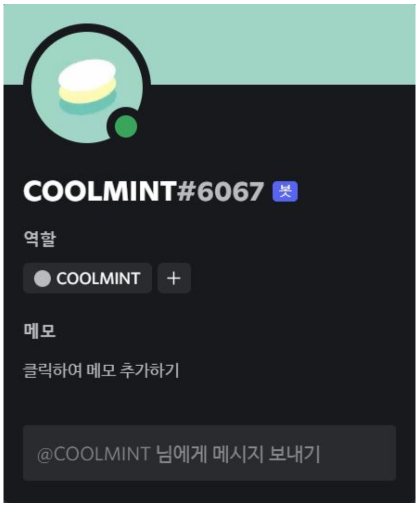
COOLMINT's target chain is Ethereum since Ethereum has the biggest NFT ecosystem. COOLMINT's smart contracts are deployed on Rinkeby testnet for testing fee issues. The smart contract is written with Solidity. Deploying and testing was done by Remix with 0.8.1 compiler and Injected Web3 Rinkeby testnet environment. The contract is deployed on address 0x518A0e3261ac938bFF0a4251E3d4Ac1612C8ec06, so it can be found out on etherscan for rinkeby testnet.

The contract follows ERC-721 for NFTs on Ethereum network. The constructor for smart contract takes name, symbol, maxNFTSupply, saleStart, price as an input. The contract owner who deployed the contract can only withdraw the deposit for buying the NFTs and the minting can be started by calling flipSaleState function.

IV. Results

A. Discord Bot

The Discord bot ”COOLMINT” has a function of connecting through external links for NFT minting and NFT purchase, registering and modifying information (notices, minting dates, WL/OG conditions, etc.), easily checking registered information through buttons, and informing how to use all commands.



COOLMINT#6067 봇

역할

COOLMINT

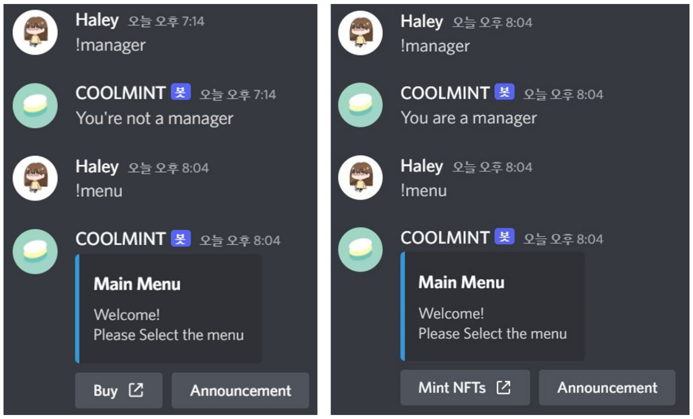
메모

클릭하여 메모 추가하기

@COOLMINT 님에게 메시지 보내기

Fig. 4. Discord Bot ”COOLMINT”.

Bot ”COOLMINT” is successfully registered on Discord.



Haley 오늘 오후 7:14
!manager

COOLMINT 봇 오늘 오후 7:14
You're not a manager

Haley 오늘 오후 8:04
!menu

COOLMINT 봇 오늘 오후 8:04
Main Menu
Welcome!
Please Select the menu

Haley 오늘 오후 8:04
!manager

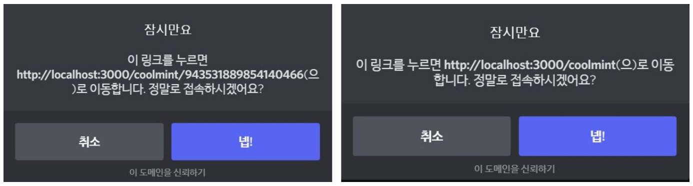
COOLMINT 봇 오늘 오후 8:04
You are a manager

Haley 오늘 오후 8:04
!menu

COOLMINT 봇 오늘 오후 8:04
Main Menu
Welcome!
Please Select the menu

Fig. 5. Main menu for ordinary users and managers

The bot can check whether the user is a manager or not, and the buttons that appear in the main menu differ depending on the role. Each button is connected by an external link for wallet connection.



잠시만요

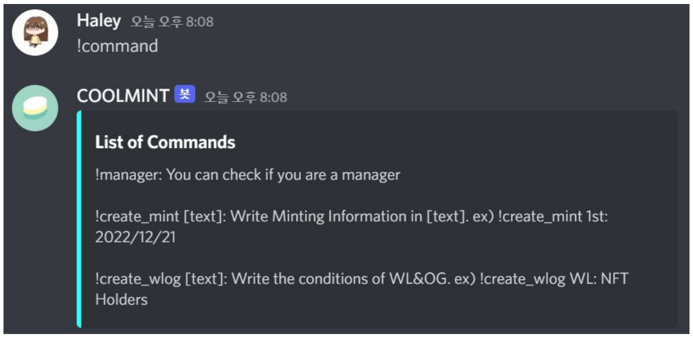
이 링크를 누르면 http://localhost:3000/coolmint/943531889854140466(으)로 이동합니다. 정말로 접속하시겠어요?

잠시만요

이 링크를 누르면 http://localhost:3000/coolmint(으)로 이동합니다. 정말로 접속하시겠어요?

Fig. 6. NFT purchase link(left), NFT minting link(right)

It is connected to the NFT purchase link for general users and to the NFT minting link for managers. The NFT purchase link is an url that combines the NFT minting link with the Discord channel ID.



Haley 오늘 오후 8:08
!command

COOLMINT 봇 오늘 오후 8:08

List of Commands

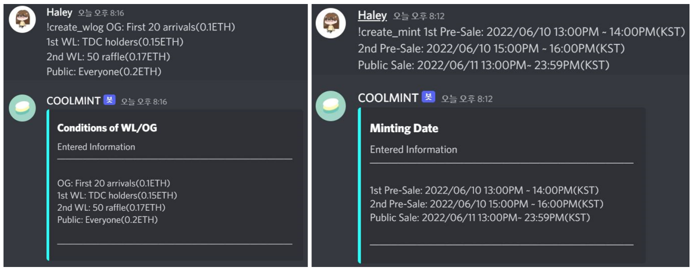
!manager: You can check if you are a manager

!create_mint [text]: Write Minting Information in [text]. ex) !create_mint 1st: 2022/12/21

!create_wlog [text]: Write the conditions of WL&OG. ex) !create_wlog WL: NFT Holders

Fig. 7. List of commands

It provides a list of commands that can be used by the managers and how to use them.



Haley 오늘 오후 8:16
!create_wlog OG: First 20 arrivals(0.1ETH)
1st WL: TDC holders(0.15ETH)
2nd WL: 50 raffle(0.17ETH)
Public: Everyone(0.2ETH)

COOLMINT 봇 오늘 오후 8:16

Conditions of WL/OG
Entered Information

OG: First 20 arrivals(0.1ETH)
1st WL: TDC holders(0.15ETH)
2nd WL: 50 raffle(0.17ETH)
Public: Everyone(0.2ETH)

Haley 오늘 오후 8:12
!create_mint 1st Pre-Sale: 2022/06/10 13:00PM ~ 14:00PM(KST)
2nd Pre-Sale: 2022/06/10 15:00PM ~ 16:00PM(KST)
Public Sale: 2022/06/11 13:00PM~ 23:59PM(KST)

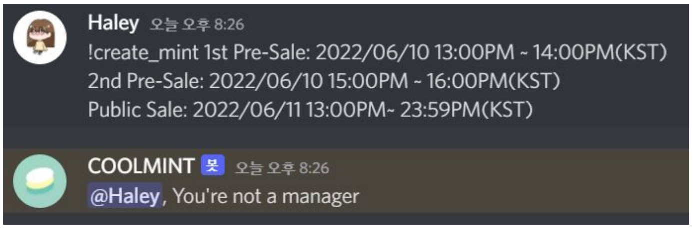
COOLMINT 봇 오늘 오후 8:12

Minting Date
Entered Information

1st Pre-Sale: 2022/06/10 13:00PM ~ 14:00PM(KST)
2nd Pre-Sale: 2022/06/10 15:00PM ~ 16:00PM(KST)
Public Sale: 2022/06/11 13:00PM~ 23:59PM(KST)

Fig. 8. Register announcements(manager)

Managers can register announcements such as minting date and conditions of white list and original gangster.

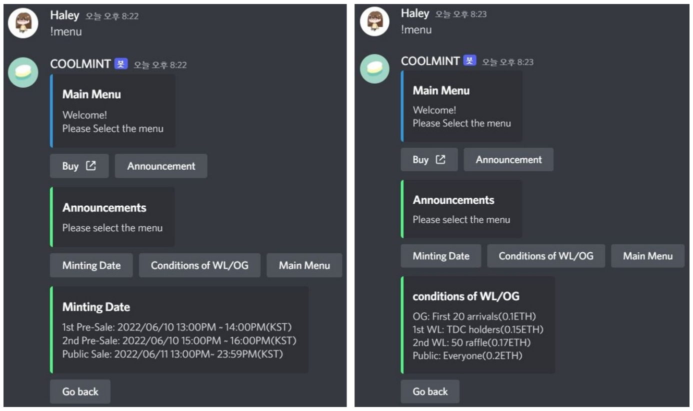


Haley 오늘 오후 8:26
!create_mint 1st Pre-Sale: 2022/06/10 13:00PM ~ 14:00PM(KST)
2nd Pre-Sale: 2022/06/10 15:00PM ~ 16:00PM(KST)
Public Sale: 2022/06/11 13:00PM~ 23:59PM(KST)

COOLMINT 봇 오늘 오후 8:26
@Haley, You're not a manager

Fig. 9. User trying to register announcement

If a general user who is not a manager tries to register the announcements, bot COOLMINT alerts that the user is not a manager and the user cannot register the announcement.



Haley 오늘 오후 8:22
!menu

COOLMINT 봇 오늘 오후 8:22

Main Menu
Welcome!
Please Select the menu

Announcements
Please select the menu

Minting Date
1st Pre-Sale: 2022/06/10 13:00PM - 14:00PM(KST)
2nd Pre-Sale: 2022/06/10 15:00PM - 16:00PM(KST)
Public Sale: 2022/06/11 13:00PM- 23:59PM(KST)

Haley 오늘 오후 8:23
!menu

COOLMINT 봇 오늘 오후 8:23

Main Menu
Welcome!
Please Select the menu

Announcements
Please select the menu

conditions of WL/OG
OG: First 20 arrivals(0.1ETH)
1st WL: TDC holders(0.15ETH)
2nd WL: 50 raffle(0.17ETH)
Public: Everyone(0.2ETH)

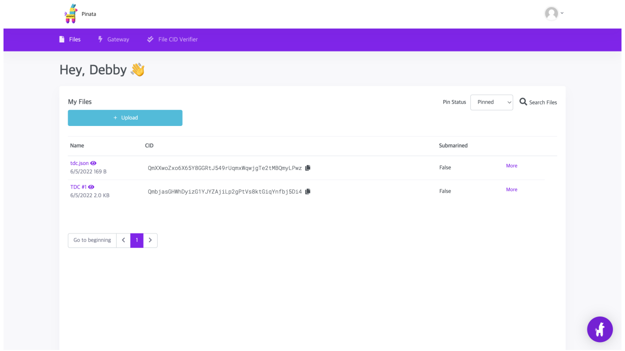
Fig. 10. Check the announcements(user)

After the managers register the announcements, users can check the announcements on the main menu. Unlike when registering announcements, information can be easily retrieved with a button without a complicated command.

B. *Minting*

If you are a Creator and want to mint(publish) NFTs, you can click the ”Mint NFTs” button in the right figure of Fig5, and move to the minting web page.

But before doing that, you have to upload your NFT image files and metadatas first.



Hey, Debby 👋

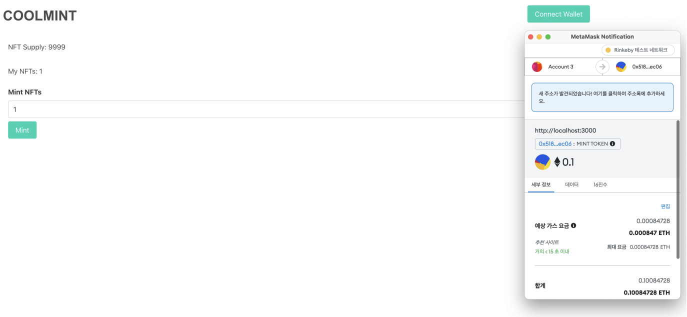
My Files

Pin Status: Pinned

Name	CID	Submarined	
tdc.json 6/5/2022 169 B	QmXXwoZxo6X65Y8GGRtJ549rUqmxWqwjgTe2tMBQmyLPwz	False	More
TDC #1 6/5/2022 2.0 KB	QmbjasGHWhDyizG1YJYZAjiLp2gPtVs8ktGiqYnfbj5Di4	False	More

Fig. 11. Entering the image file metadatas of NFT.

If you are a buyer, if the NFT Supply is more than 0, you can enter the amount of NFTs you want to buy and simply click the Mint button to buy NFTs. A Metamask pop up will show up for signature. With enough Ether, transaction will be made and you will receive NFT to your wallet address.



COOLMINT

NFT Supply: 9999

My NFTs: 1

Mint NFTs: 1

Rinkeby 테스트 네트워크

Account 3 → 0x518...ec06

새 주소가 발견되었습니다! 여기를 클릭하여 주소록에 추가하세요.

http://localhost:3000

0x518...ec06 : MINT TOKEN

0.1

예상 가스 요금: 0.00084728 / **0.000847 ETH**

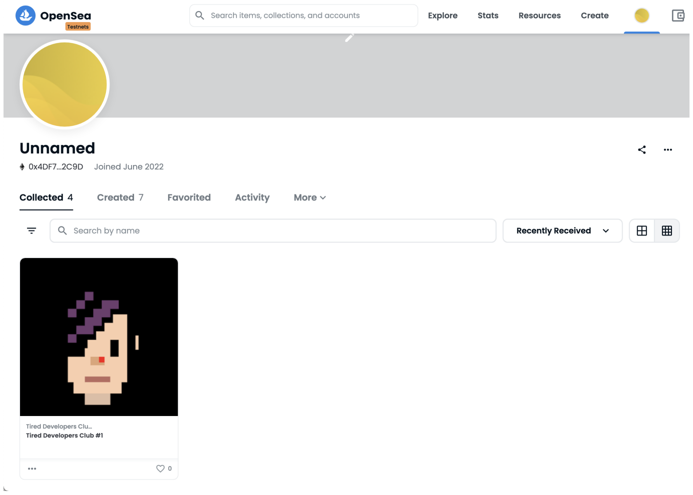
추천 사이트
거의 < 15 초 이내

최대 요금 0.00084728 ETH

합계: 0.10084728 / **0.10084728 ETH**

Fig. 12. Minting page for buyers

NFTs you have bought can be checked out on Opensea by connecting your wallet that you have made transaction with. With a thumbnail image, project name and the NFT number will be written in the box.



Unnamed

0x4DF7...2C9D Joined June 2022

Tired Developers Clu...
Tired Developers Club #1

Fig. 13. NFTs bought can be checked on Opensea

V. Discussion

A. *Smart Contract*

We used Openzeppelin library when implementing the solidity smart contract. Managing the IPFS image and metadata was quite a tricky part, and still has some parts that are not automatic. So we will automate creating metadata and making serial NFT images, and that is our future work.

B. *Discord Bot*

The Discord bot had to sign up and log in by entering personal information, and it had to connect with an external link to connect the wallet. In addition, the commands used by Discord server managers to register information are too complex and diverse. In order to solve these inconveniences, the development of a new NFT platform that can be easily logged in through a wallet connection and can register and view information through GUI(Graphical User Interface) rather than CLI(Command Line Interface) was set as future work.

VI. Reference

References

[1] Finley, Klint (2016-06-20). ”The Inventors of the Internet Are Trying to Build a Truly Permanent Web”. Wired. ISSN 1078-3148. OCLC 24479723. Archived from the original on 2020-12-15. Retrieved 2017-03-07.