

Blockchain

Create and Deploy an ERC721A Token

2024

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What is an ERC-721 Token?

- 和前者ERC-20不同，ERC-721旨在創造具有**不可替代性**以及**不可分割性**的代幣(**Token**)，也就是大家所熟悉的**非同質化代幣—NFT (Non-Fungible Token)**。
 - **不可替代性**：每個NFT都具有它的獨特性，獨一無二且無法取代，同樣被儲存在鏈上後，也无法隨便刪除。
 - **不可分割性**：除非智能合約允許，否則NFT是沒辦法像加密貨幣一樣，被拆成更小的份數進行交易。
- 其實只要一個物件能**具有特殊價值**，就適合以**NFT**這種代幣標準被創造出，比如藝術創作、音樂，或者是目前最常見的個人頭像、**PFP(Profile Picture)**，一般來說是沒辦法找到另一個價值完全對等的ERC-721代幣。
- NFT也可以看做一個數位創作或資產的所有權，與以往的藝術作品不同，NFT作為獨特的數位代幣，**創作者可以透過版費(royalties)的方式**，在每一筆交易中持續獲得收入，就算買賣雙方沒有創作者參與也是如此。

What is an ERC-721A Token?

- ERC721A is an improved implementation of the ERC721 Non-Fungible Token Standard that supports minting multiple tokens for close to the cost of one.

ERC721A

A screenshot of a web browser window displaying the ERC721A website at <https://www.erc721a.org>. The page has a blue header with the title 'ERC721A'. Below the header is a large white section containing the text: 'ERC721A is an improved implementation of the IERC721 standard that supports minting multiple tokens for close to the cost of one.' At the bottom of this section are two links: 'More Info' and 'GitHub'. A red sidebar on the right side of the page also contains the text 'ERC721A'.

ERC721A

ERC721A is an improved implementation of the IERC721 standard that supports minting multiple tokens for close to the cost of one.

[More Info](#) // [GitHub](#)

CREATED BY AZUKI ([@locationtba](#), [@2pmflow](#))

Measurements - 1

NUMBER MINTED	GAS USED (ENUMERABLE)	GAS USED (ERC721A)	GAS SAVED
Mint 1	154,814	76,690	78,124
Mint 2	270,339	78,819	191,520
Mint 3	384,864	80,948	303,916
Mint 4	501,389	83,077	418,312
Mint 5	616,914	85,206	531,708

Measurements - 2

cost in USD assuming 300 gwei and \$3500/ETH

NUMBER MINTED	USD MINT COST (ENUMERABLE)	USD MINT COST (ERC721A)	DIFFERENCE
Mint 1	\$162.55	\$80.52	\$82.03
Mint 2	\$283.86	\$82.76	\$201.10
Mint 3	\$461.84	\$85.00	\$376.84
Mint 4	\$526.46	\$87.23	\$439.23
Mint 5	\$740.30	\$89.47	\$650.83



Create an ERC-721A Token



Case 1

Create an ERC-721A Token

The screenshot shows the Remix Ethereum IDE interface. On the left, the **FILE EXPLORER** panel displays the workspace **Alchemy_dNFT**. A red box highlights the folder icon in the sidebar of the file explorer. The workspace contents include **.deps**, **contracts**, **scripts**, **tests**, and **README.txt**. The main central area features the **REMIX** logo and the tagline *The Native IDE for Web3 Development.* Below it, there are several buttons: **Start Coding**, **ZK Semaphore**, **ERC20**, **Uniswap V4 Hooks**, **NFT / ERC721**, and **MultiSig**. To the right, the **Featured** section highlights the **v0.54.0 RELEASE HIGHLIGHTS**, which include: Login to GitHub from 'File Explorer', Added Cookbook workspace templates, and Added 'sendRawTransaction' API to remix-simulator. There is also a **What's New** section with a cartoon character and a **Read More** button. At the bottom, there are sections for **Recent Workspaces**, **Accessible Libraries** (listing `web3.js` and `ethers.js`), and **Featured Plugins**. A footer bar at the bottom includes links for **Initialize as git repo**, **Did you know?**, **RemixAI Copilot (enabled)**, and **Scam Alert**.

Modify Salu721A.sol

The screenshot shows the Ethereum IDE interface with the following components:

- FILE EXPLORER:** Shows WORKSPACES and the current workspace named "Salu_BlockChain". Inside, there are files: ERC721A.sol, IERC721A.sol, and Salu721A.sol. The Salu721A.sol file is selected and highlighted with a red box.
- Code Editor:** Displays the Solidity code for Salu721A.sol. The code imports necessary contracts and defines a new contract Salu721A that inherits from ERC721A and Ownable. It includes a baseURI and uriSuffix variable, and a SetBaseURI function.
- Bottom GitHub Repository:** A modal window shows the GitHub repository for the ERC721A contract. It lists files like .github, contracts, extensions, interfaces, and mocks. Under contracts, it shows subfolders main, extensions, interfaces, and mocks, each containing ERC721A.sol and IERC721A.sol. A blue arrow points from this GitHub interface to the Salu721A.sol file in the IDE.

Copy SPDX-License

The screenshot shows the Remix Ethereum IDE interface. On the left, the FILE EXPLORER sidebar lists workspaces: Salu_BlockChain, ERC721A.sol, IERC721A.sol, and Salu721A.sol. A red box highlights Salu721A.sol, and a blue circle labeled '1' is placed over it. In the main code editor area, the file Salu721A.sol is open. A red box highlights the first two lines of the code: `// SPDX-License-Identifier: MIT` and `pragma solidity ^0.8.4;`. A blue circle labeled '2' is placed over the first line. To the right of the code editor, a 'Copy' button is also highlighted with a red box. At the bottom of the interface, there are buttons for 'Scam Alert', 'Initialize as git repo', 'Did you know?', 'RemixAI Copilot (enabled)', and a search bar.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.4;

import "@openzeppelin/contracts/utils/Strings.sol";
import "@openzeppelin/contracts/access/Ownable.sol";
// ERC-721A
import "./ERC721A.sol";

contract Salu721A is ERC721A, Ownable {

    using Strings for uint256;

    string public baseUri = "";
    string public uriSuffix = ".json";
    bool public enableMint = false;

    event SetBaseURI(address _from);

    constructor()

```

Flatten Salu721A.sol

The screenshot shows the Remix Ethereum IDE interface. On the left, the File Explorer sidebar displays a workspace named "Salu_BlockChain" containing files "ERC721A.sol" and "IERC721A.sol". A file named "Salu721A.sol" is selected and highlighted with a red box. A context menu is open over this file, with the "Flatten" option highlighted and also enclosed in a red box. A blue circle with the number "1" is positioned near the workspace list, and another blue circle with the number "2" is positioned near the context menu. The main editor area shows the Solidity code for "Salu721A.sol".

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.4;

import "@openzeppelin/contracts/utils/Strings.sol";
import "@openzeppelin/contracts/access/Ownable.sol";
// ERC-721A
import "./ERC721A.sol";

contract Salu721A is ERC721A, Ownable {
    using Strings for uint256;

    string public baseURI = "";
    string public uriSuffix = ".json";
    bool public enableMint = false;

    event SetBaseURI(address _from);

    constructor()
}
```

FILE EXPLORER

WORKSPACES

Sign in

Salu_BlockChain

ERC721A.sol

IERC721A.sol

Salu721A.sol

Rename

Delete

Copy

Copy name

Copy path

Download

Publish file to qist

Flatten

Compile

Compile for Nahmii

Generate UML

Generate Docs

Scam Alert

Initialize as git repo

Did you know? You can verify your contract using the Sourcify plugin.

Listen on all transactions

Filter with transaction hash or address

RemixAI Copilot (enabled)

Salu721A_flattened.sol

Remix - Ethereum IDE

https://remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.26+co...

FILE EXPLORER

WORKSPACES

Sign in

Salu_BlockChain

.deps

artifacts

build-info

Salu721A_metadata.json

Salu721A.json

ERC721A.sol

IERC721A.sol

Salu721A_flattened.sol

Salu721A.sol

1 // File: @openzeppelin/contracts/utils/Panic.sol

2 // openZeppelin Contracts (last updated v5.1.0) (utils/Panic.sol)

3

4

5

6

7 pragma solidity ^0.8.20;

8

9 */**

10 ** @dev Helper library for emitting standardized panic codes.*

11 ***

12 ** ^``solidity*

13 ** contract Example {*

14 ** using Panic for uint256;*

15 ***

16 ** // Use any of the declared internal constants*

17 ** function foo() { Panic.GENERIC.panic(); }*

18 ***

19 ** // Alternatively*

0 Listen on all transactions

Filter with transaction hash or address

Did you know? You can verify your contract using the Sourcify plugin.

Scam Alert Initialize as git repo

RemixAI Copilot (enabled)

14

Salu721A_flattened.sol

The screenshot shows the Remix Ethereum IDE interface. On the left, the FILE EXPLORER panel displays a workspace named "Salu_BlockChain" containing several files: ".deps", "artifacts", "build-info", "Salu721A_metadata.json", "Salu721A.json", "ERC721A.sol", "IFERC721A.sol", "Salu721A_flattened.sol" (which is highlighted with a red box and a blue circle labeled '1'), and "Salu721A.sol". In the center, the code editor shows the content of "Salu721A_flattened.sol". A red box highlights the first two lines of code: `// SPDX-License-Identifier: MIT` and `// File: @openzeppelin/contracts/utils/Panic.sol`. A red arrow points from this box to a "Paste" button, also enclosed in a red box. The code itself includes a pragma solidity statement and a multi-line comment describing a helper library for emitting standardized panic codes.

```
// SPDX-License-Identifier: MIT
// File: @openzeppelin/contracts/utils/Panic.sol

pragma solidity ^0.8.20;

/**
 * @dev Helper library for emitting standardized panic codes.
 */
contract Example {
    using Panic for uint256;
}

// Use any of the declared internal constants
function foo() { Panic.GENERIC.panic(); }

// Alternatively
```

Compile Smart Contract

The screenshot shows the Remix Ethereum IDE interface with the following steps highlighted:

- Compiler Version:** The Solidity Compiler version is set to "0.8.26+commit.8a97fa7a".
- Auto Compile:** The "Auto compile" checkbox is checked.
- Contract:** The contract "Salu721A (Salu721A_flattened.sol)" is selected.
- Compile Button:** The "Compile Salu721A_flattened..." button is highlighted.

The code editor displays the Solidity source code for the "Panic" contract, which includes imports from OpenZeppelin Contracts and a pragma solidity statement. The Remix interface also shows a sidebar with various tools and a bottom bar with status messages.

```
// SPDX-License-Identifier: MIT
// File: @openzeppelin/contracts/utils/Panic.sol

// OpenZeppelin Contracts (last updated v5.1.0) (utils/Panic.sol)

pragma solidity ^0.8.20;

/**
 * @dev Helper library for emitting standardized panic codes.
 */
/* ^``solidity
* contract Example {
*     using Panic for uint256;
*
*     // Use any of the declared internal constants
*     function foo() { Panic.GENERIC.panic(); }
*
*     // Alternatively
* }
```

Deploy an ERC-721A Token

The screenshot shows the Ethereum IDE interface with the following steps highlighted:

- 1** Click the Deploy icon (diamond with arrows) in the sidebar.
- 2** Select "Injected Provider - MetaMask" from the environment dropdown.
- 3** Select "Salu721A - Salu721A_flattened.sol" from the contract dropdown.
- 4** Click the Deploy button.

The code editor on the right contains the Solidity source code for the Salu721A contract, which is a flattened version of the OpenZeppelin Panic contract.

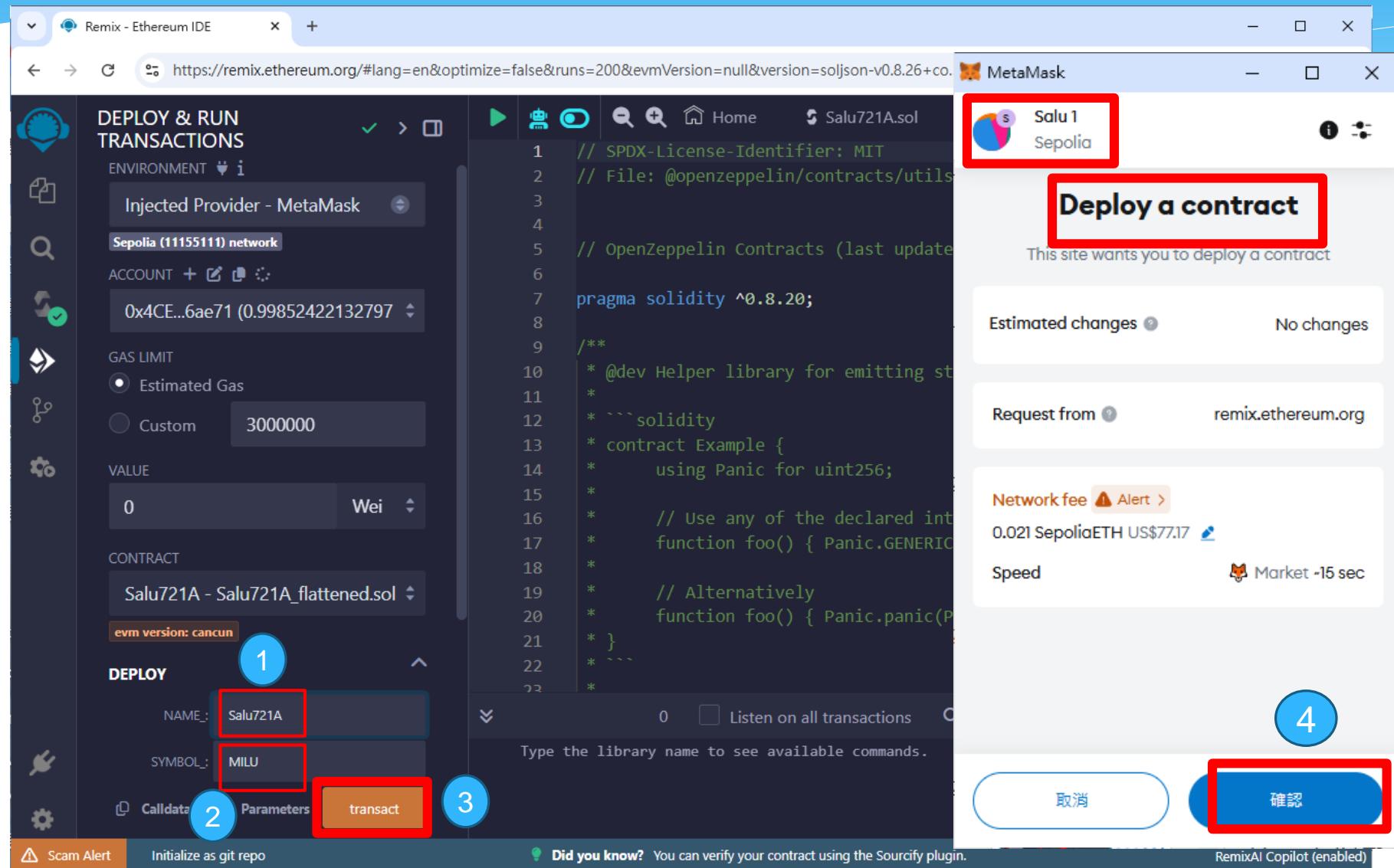
```
// SPDX-License-Identifier: MIT
// File: @openzeppelin/contracts/utils/Panic.sol

pragma solidity ^0.8.20;

/**
 * @dev Helper library for emitting standardized panic codes.
 *
 * ````solidity
 * contract Example {
 *     using Panic for uint256;
 *
 *     // Use any of the declared internal constants
 *     function foo() { Panic.GENERIC.panic(); }
 *
 *     // Alternatively
 *     function foo() { Panic.panic(Panic.GENERIC); }
 * }
 * ````
```

At the bottom, there are buttons for "Scam Alert", "Initialize as git repo", "Did you know?", "RemixAI Copilot (enabled)", and "At Address".

Deploy an ERC-721A Token



Deploy an ERC-721A Token

The screenshot illustrates the process of deploying an ERC-721A token using the Remix Ethereum IDE and MetaMask.

Remix Ethereum IDE:

- DEPLOY & RUN TRANSACTIONS:**
 - ENVIRONMENT:** Sepolia (11155111) network
 - Contract Address:** 0x4CE...6ae71 (0.97784113185587)
 - GAS LIMIT:** Estimated Gas (radio button selected)
 - Value:** 0 Wei
- CONTRACT:** Salu721A - Salu721A_flattened.sol
- DEPLOY:**
 - NAME_: Salu721A
 - SYMBOL_: MILU
 - Calldata, Parameters, transact buttons

MetaMask:

- Address: 0x4CE13...6ae71
- Balance: 0.9778 SepoliaETH
- Icons: Buy & Sell, Swap, Bridge, 發送 (Send), 接收 (Receive)
- Tokens tab: Dec 19, 2024, 部署合約 已確認 (Deployment contract confirmed)
- NFTs tab: Dec 18, 2024, 部署合約 已確認 (Deployment contract confirmed)
- Transactions tab: Dec 18, 2024, 部署合約 已確認 (Deployment contract confirmed)

Deploy an ERC-721A Token

The screenshot shows the Remix Ethereum IDE interface. On the left, the 'DEPLOY & RUN TRANSACTIONS' sidebar is visible, showing the environment set to 'Injected Provider - MetaMask' and the account selected as '0x4CE...6ae71 (0.97784113185587)'. The GAS LIMIT is set to 'Estimated Gas' (3000000). In the center, the Solidity code for the Salu721A contract is displayed:

```
// SPDX-License-Identifier: MIT
// File: @openzeppelin/contracts/utils/Panic.sol
//
// OpenZeppelin Contracts (last updated v5.1.0) (utils/Panic.sol)
pragma solidity ^0.8.20;

/*
 * @dev Helper library for emitting standard errors.
 */
contract Example {
    * using Panic for uint256;
    *
    * Use any of the declared internal functions to panic:
    function foo() { Panic.GENERIC.panic(); }
    *
    * Alternatively
    function foo() { Panic.panic(Panic.GENERIC); }
    *
}
```

At the bottom of the central pane, there is a green checkmark icon next to the text: [block:7308771 txIndex:31] from: 0x4ce...6ae71 to: Salu721A flattened.sol data: 0x608...00000 logs: 1 hash: 0x223...8c358. Below this, a 'view on etherscan' button is highlighted with a red box.

A large deployment confirmation modal is open on the right, titled '部署合約'. It contains the following information:

Status	View on block explorer
已確認	後裏交易 ID
來源帳戶	目的帳戶
0x4CE13...6...	建立新合約
交易	
Nonce	51
數量	-0 SepoliaETH
Gas 上限(單位)	2489200
Gas 用量(單位)	2468442
Base fee (GWEI)	6.879005653
Priority fee (GWEI)	1.5
Total gas fee	0.020683 SepoliaETH
Max fee per gas	0.00000003 SepoliaETH
總量	0.02068309 SepoliaETH

The 'View on block explorer' button in the modal is also highlighted with a red box. At the bottom of the modal, the status is shown as '已確認'.

View Transaction on Sepolia

The screenshot shows a web browser displaying the Etherscan Sepolia Testnet transaction details for the hash `0x6efe8128a96ded5c8b10274a68995b712d0824c5a29742024b286348842c74f4`. The transaction was successful, having 40 block confirmations at block `7308771` and occurring 8 minutes ago. The transaction action was a call to contract `0x60806040` via method `0x4CE135aB...64E06ae71`. The transaction originated from address `0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71` and was sent to address `0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6`, which was created by the transaction.

[This is a Sepolia **Testnet** transaction only]

② Transaction Hash: `0x6efe8128a96ded5c8b10274a68995b712d0824c5a29742024b286348842c74f4`

② Status: Success

② Block: `7308771` 40 Block Confirmations

② Timestamp: 8 mins ago (Dec-19-2024 03:57:12 AM UTC)

④ Transaction Action: Call `0x60806040` Method by `0x4CE135aB...64E06ae71`

② From: `0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71`

② To: `[0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6 Created]`

Click contract address

Smart Contract Information

The screenshot shows the Etherscan interface for a Sepolia Testnet smart contract at address `0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6`. The page is titled "Contract Address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6". The main content area includes sections for Overview, More Info, Multichain Info, and a Transaction table.

- Contract Address:** `0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F` (highlighted with a red box).
- More Info:**
 - CONTRACT CREATOR:** `0x4CE135aB...64E06ae71` (at tx `0x6efe8128a96...`)
 - TOKEN TRACKER:** `Salu721A (MILU)` (highlighted with a red box and a blue "click" button with an arrow pointing to it).
- Multichain Info:** N/A
- Transactions:** A table showing transaction details. The first row is highlighted with a red box.

Smart Contract Information

The screenshot shows a browser window displaying the Etherscan interface for a token named Salu721A (MILU) on the Sepolia Testnet. The URL in the address bar is <https://sepolia.etherscan.io/token/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6>.

The page is divided into several sections:

- Token Header:** Shows the token name "Salu721A (MILU)" with a red box around it.
- ERC-721:** A section indicating the token standard.
- Overview:** A summary of token statistics:
 - MAX TOTAL SUPPLY:** 0 MILU (highlighted with a red box)
 - HOLDERS:** 0
 - TOTAL TRANSFERS:** 0
- Market:** Information about the token's market value:
 - ONCHAIN MARKET CAP: \$0.00
 - CIRCULATING SUPPLY MARKET CAP: -
- Other Info:** A link to the token contract address: [0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6](https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6).

At the bottom, there is a table header for transaction history with columns: Transaction Hash, Method, Block, Age, From, To, and TokenID, all highlighted with a red box.

View & Publish

The screenshot shows a web browser displaying the Etherscan interface for a smart contract at address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The browser title bar reads "Contract Address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6". The URL in the address bar is <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#code>. The page header includes the Sepolia Testnet logo, the Etherscan logo, and navigation links for Home, Blockchain, Tokens, NFTs, and More.

The main content area displays the contract details:

- Overview:** ETH BALANCE: 0 ETH
- More Info:** CONTRACT CREATOR: 0x4CE135aB...64E06ae71 (at tx [0x6efef8128a96...](#))
TOKEN TRACKER: Salu721A (MILU)
- Multichain Info:** N/A

Below the details, there are tabs for Transactions, Token Transfers (ERC-20), Contract (highlighted with a red box), and Events.

A prominent call-to-action message is displayed: "Are you the contract creator? [Verify and Publish](#) your contract source code today!" This message is also highlighted with a red box.

At the bottom, there are links for Decompile Bytecode, Switch to Opcodes View, and Similar Contracts.

View & Publish Contract Source Code

The screenshot shows a web browser window titled "Verify & Publish Contract Source Code" from the Sepolia Testnet on etherscan.io. The URL in the address bar is <https://sepolia.etherscan.io/verifyContract?a=0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6>. The page displays a form for entering contract details. The contract address "0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6" is highlighted with a red box. The compiler type is set to "Solidity (Single file)" and the version is "v0.8.26+commit.8a97fa7a", both also highlighted with red boxes. The "Open Source License Type" is selected as "3) MIT License (MIT)", which is also highlighted with a red box. At the bottom, there are two checkboxes: "Uncheck to show all nightly commits" and "I agree to the terms of service", both of which have a checked status and are highlighted with red boxes. The "Continue" button at the bottom is also highlighted with a red box.

Verify & Publish Contract Source Code

Source code verification provides transparency for users interacting with smart contracts. By uploading the source code, Etherscan will match the compiled code with that on the blockchain. [Read more](#).

1 Enter Contract Details — 2 Verify & Publish

Please enter the Contract Address you would like to verify
0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6

Please select Compiler Type
Solidity (Single file)

Please select Compiler Select Compiler Type before selecting Compiler Version
v0.8.26+commit.8a97fa7a

Uncheck to show all nightly commits

Please select Open Source License Type i
3) MIT License (MIT)

I agree to the [terms of service](#)

Continue Reset

View & Publish Contract Source Code

The screenshot shows a web browser window for the Sepolia Testnet on Etherscan. The URL in the address bar is <https://sepolia.etherscan.io/verifyContract-solc?a=0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6&c=v0.8.26%2bcommit.8a97fa7a>. The page title is "Sepolia Solidity Contract Sour". The main heading is "Verify & Publish Contract Source Code". Below it, a sub-instruction reads: "Source code verification provides transparency for users interacting with smart contracts. By uploading the source code, Etherscan will match the compiled code with that on the blockchain. [Read more.](#)" A note below states: "A simple and structured interface for verifying smart contracts that fit in a single file." The interface has two steps: "1 Enter Contract Details" and "2 Verify & Publish", with step 2 being active. A section titled "Upload Contract Source Code" contains three numbered instructions: 1. If the contract compiles correctly at REMIX, it should also compile correctly here. 2. We have limited support for verifying contracts created by another contract and there is a timeout of up to 45 seconds for each contract compiled. 3. For programmatic contract verification, check out the [Contract API Endpoint](#). At the bottom, there are three input fields: "Contract Address:" with value **0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6**, "Compiler Type:" with value **SINGLE FILE / CONCATENATED METHOD**, and "Compiler Version:" with value **v0.8.26+commit.8a97fa7a**. The "Contract Address:" field is highlighted with a red border.

1 Enter Contract Details — 2 Verify & Publish

Upload Contract Source Code

1. If the contract compiles correctly at [REMIX](#), it should also compile correctly here.
2. We have limited support for verifying contracts created by another contract and there is a timeout of up to 45 seconds for each contract compiled.
3. For programmatic contract verification, check out the [Contract API Endpoint](#).

Contract Address: **0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6**

Compiler Type: **SINGLE FILE / CONCATENATED METHOD**

Compiler Version: **v0.8.26+commit.8a97fa7a**

View & Publish Contract Source Code

The screenshot shows a web browser window titled "Sepolia Solidity Contract Sour" with the URL <https://sepolia.etherscan.io/verifyContract-solc?a=0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6&c=v0.8.26%2bcommit.8a97f...>. The page displays a Solidity contract code:

```
function tokenURI(uint256 _tokenId) public view virtual override returns (string memory) {
    require(_exists(_tokenId), "URI query for nonexistent token");

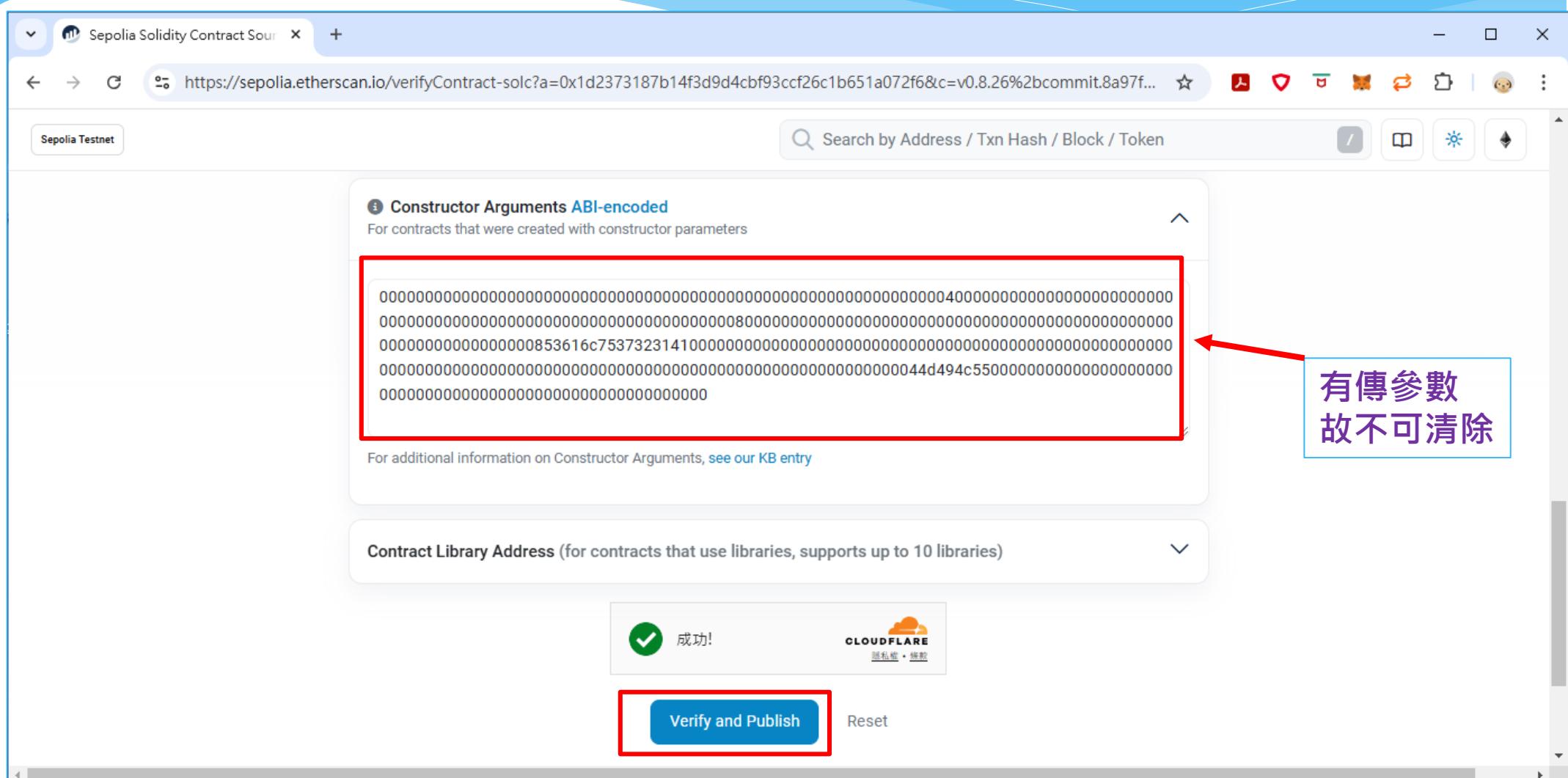
    string memory currentBaseURI = _baseURI();
    return bytes(currentBaseURI).length > 0
        ? string(abi.encodePacked(currentBaseURI, _tokenId.toString(), uriSuffix))
        : "";
}
```

A red box highlights the function body. A red arrow points from a text box on the right to the highlighted code, containing the instruction: "請把flatten的檔案 Salu721A_flattened.sol 貼上來。".

Advanced Configuration settings include:

- Optimization: No
- Runs (Optimizer): 200
- EVM Version to target: default (compiler defaults)
- License Type: 3) MIT License (MIT)

View & Publish Contract Source Code



View & Publish Contract Source Code

The screenshot shows a web browser window for the Sepolia Testnet on Etherscan. The URL is <https://sepolia.etherscan.io/verifyContract-solc?a=0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6&c=v0.8.26%2bcommit.8a97f...>. The page title is "Sepolia Solidity Contract Sour". The main content is titled "Verify & Publish Contract Source Code". It explains that source code verification provides transparency and matches uploaded code with blockchain. A red box highlights a success message: "Successfully generated Bytecode and ABI for Contract Address [0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6]". A red arrow points to the "click" button next to the "Verify & Publish" step. Other visible sections include "Enter Contract Details", "Code Reader", and a note about verifying on multiple blockchains.

Sepolia Solidity Contract Sour

https://sepolia.etherscan.io/verifyContract-solc?a=0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6&c=v0.8.26%2bcommit.8a97f...

Etherscan

Search by Address / Txn Hash / Block / Token

Home Blockchain Tokens NFTs More

Verify & Publish Contract Source Code

Source code verification provides transparency for users interacting with smart contracts. By uploading the source code, Etherscan will match the compiled code with that on the blockchain. [Read more](#).

A simple and structured interface for verifying smart contracts that fit in a single file.

1 Enter Contract Details — 2 Verify & Publish

Successfully generated Bytecode and ABI for Contract Address
[0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6]

Learn how to verify your contract on multiple blockchains with a single API key [here](#).

Code Reader

click

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View Contract Source Code

The screenshot shows a web browser window displaying the Etherscan contract details page for the address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The URL in the address bar is https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#code. A red box highlights the URL.

Key elements visible on the page include:

- Contract Source Code Verified (Exact Match)**: Indicated by a green checkmark icon.
- Contract Name:** Salu721A (highlighted by a red box).
- Compiler Version:** v0.8.26+commit.8a97fa7a
- Optimization Enabled:** No with 200 runs
- Other Settings:** default evmVersion, MIT license
- Contract Source Code (Solidity):** A code editor pane showing the Solidity source code for the Salu721A contract. The first few lines of the code are:

```
1 /**
2  *Submitted for verification at Etherscan.io on 2024-12-19
3 */
4
5 // SPDX-License-Identifier: MIT
6 // File: @openzeppelin/contracts/utils/Panic.sol
7
8
9 // OpenZeppelin Contracts (last updated v5.1.0) (utils/Panic.sol)
10
11 pragma solidity ^0.8.20;
12
13 /**
14  * @dev Helper library for emitting standardized panic codes.
15  *
16  * ``solidity``
```

A red box highlights the first few lines of the code.

View & Publish Contract Source Code

The screenshot shows the Etherscan interface for a contract at address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The 'Source Code' tab is selected. A red box highlights the 'Contract' button in the navigation bar, and another red box highlights the 'Code' button in the bottom toolbar. The page displays the following information:

- Overview:** ETH BALANCE: 0 ETH
- More Info:** CONTRACT CREATOR: 0x4CE135aB...64E06ae71 (at txn 0x6efe8128a96...) TOKEN TRACKER: Salu721A (MILU)
- Multichain Info:** N/A

At the bottom, there are sections for **Transactions**, **Token Transfers (ERC-20)**, **Contract**, and **Events**. The **Contract** tab is active. The bottom toolbar includes buttons for **Code** (highlighted), **Read Contract**, and **Write Contract**. A search bar for source code is also present.

Connect to Web3

The screenshot shows a web browser window displaying the Etherscan.io contract page for address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The URL in the address bar is <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#readContract>.

The page title is "Contract 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6". The navigation tabs at the top include "Transactions", "Token Transfers (ERC-20)", "Contract" (which is active), and "Events".

The main content area includes sections for "Source Code", "Overview" (ETH BALANCE: 0 ETH), and "Code". The "Code" section contains two buttons: "Read Contract" (highlighted with a red box) and "Write Contract". Below these buttons is a button labeled "Connect to Web3" (also highlighted with a red box). A red arrow points from the "Connect to Web3" button to a large red box that encloses a note and two confirmation buttons.

sepolia.etherscan.io 顯示

Please take note that this is a beta version feature and is provided on an "as is" and "as available" basis. Etherscan does not give any warranties and will not be liable for any loss, direct or indirect through continued use of this feature.

確定 取消

At the bottom right of the page are "[Expand all]" and "[Reset]" buttons.

Connect a Wallet-MetaMask

The screenshot shows a web browser window displaying the Etherscan interface for a Sepolia Testnet contract at address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The 'Contract' tab is selected. A modal window titled 'Connect a Wallet' is overlaid on the page. The modal contains a note about optional wallet connection for read functions, followed by three wallet options: 'MetaMask' (selected and highlighted with a red box), 'WalletConnect', and 'Coinbase Wallet'. The background of the Etherscan interface shows the contract's overview, including its ETH balance of 0 ETH.

Salu721A | Address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6

https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#readContract

Connect a Wallet

Connecting wallet for read function is optional, useful if you want to call certain functions or simply use your wallet's node.

MetaMask Popular

WalletConnect

Coinbase Wallet

Transactions Token Transfers (ERC-20) Contract Events

Code Read Contract Write Contract

Connect to Web3

Read Contract Information

[Expand all] [Reset]

Connected Web3 using account

The screenshot shows a web browser window and a Metamask extension interface. The browser displays the Sepolia Ethereum address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6 on the etherscan.io website. The Metamask interface shows the same address and a balance of 1.5522 SepoliaETH. A red arrow points from the 'Connected - Web3 [0x4ce1...ae71]' message in the browser's bottom bar to the Metamask extension's address field.

https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#readContract

Read Contract

The screenshot shows a web browser window for the Sepolia Testnet on etherscan.io. The URL in the address bar is <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#readContract>. The page displays a list of contract functions with their parameters and return types. Four specific fields are highlighted with red boxes:

- 6. name: Salu721A string
- 7. owner: 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71 address
- 10. symbol: MILU string
- 13. uriSuffix: json string

The rest of the functions listed are: 8. ownerOf, 9. supportsInterface, 11. tokenURI, 12. totalSupply.

Connected Web3 using account

The image shows a web browser with two tabs open. The left tab is on etherscan.io, displaying the contract overview for address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The status bar at the bottom of this tab shows "Connected - Web3 [0x4ce1...ae71]". A red box highlights this status bar, and a red arrow points from it to the corresponding status bar in the right tab. The right tab is a wallet interface showing a balance of 1.5522 SepoliaETH and a transaction history. The address 0x4CE135aB...64E06a is highlighted with a red box in both the top header and the transaction history section.

Contract 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6

Source Code

Overview

ETH BALANCE
0 ETH

Transactions Token Transfers (ERC-20) Contract Events

Code Read Contract Write Contract

Connected - Web3 [0x4ce1...ae71]

1. airdrop (0xb63f02e)
2. approve (0x095ea7b3)

More Info

CONTRACT CREATOR
0x4CE135aB...64E06a at txn 0x6efe8128a96...

TOKEN TRACKER
Salu721A (MILU)

Search by Address /

1.5522 SepoliaETH

Portfolio

Buy & Sell Swap Bridge 發送 接收

Tokens NFTs 交易紀錄

Nov 19, 2024

部署合約 已確認 -0 SepoliaETH -0 ETC

Oct 30, 2024

接收 已確認 0.01 SepoliaETH 1.19 ETC

接收 已確認 0.05 SepoliaETH 5.93 ETC

[End all] [Reset]

Write Contract – setMint()

The screenshot shows a web browser window for Sepolia Testnet with the URL <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>. On the left, a list of functions is visible:

- 6. safeTransferFrom (0xb88d4fde)
- 7. setApprovalForAll (0xa22cb465)
- 8. setBaseUri (0xa0bcfc7f)
- 9. setMint (0x429ff28d)
- 10. setUriSuffix (0x16ba10e0)

Below the list, there is a field labeled "value (bool)" containing "true". To the right of this field is a red button labeled "Write" with the number "1" next to it. A red arrow points from this "Write" button to a callout box containing the following text:

因為我們在合約mint中有一段限制
(require)的程式，故在還沒設定啟用鑄造
(mint)功能前，鑄造功能是無法使用的，
所以我們要先啟用鑄造(setMint)功能。

To the right of the browser window is the MetaMask extension interface. It displays the transaction request details:

- Request from: sepolia.etherscan.io
- Interacting with: 0x1D237...072F6
- Network fee: 0.0025 SepoliaETH US\$0.05
- Speed: Market -15 sec

At the bottom of the MetaMask window, there are two buttons: "取消" (Cancel) and "確認" (Confirm), with the "確認" button also having a red border.

View transaction - setMint()

The screenshot shows a web browser window for the Sepolia Testnet on etherscan.io. The URL in the address bar is <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>. The page displays a list of transactions:

- 7. setApprovalForAll (0xa22cb465)
- 8. setBaseUri (0xa0bcfc7f)
- 9. setMint (0x429ff28d)
- value (bool)
true
- Write **View your transaction**
- 10. setUriSuffix (0x16ba10e0)
- 11. transferFrom (0x23b872dd)

A red arrow points from a callout box to the "View your transaction" button. The callout box contains the following text:

當我們設定啟用鑄造(mint)程序後，該交易transaction即開始進行，按下**View your transaction**可看到執行的結果。

View Transaction Details

The screenshot shows a browser window displaying the Etherscan Transaction Details page for a Sepolia Testnet transaction. The transaction hash is `0xd8b129b96244141728ad6019ab1e7d58079aaa62b693fcb1758cd84fcdfedfc7`. The status is listed as "Success". A callout box highlights this status message.

當我們在前一動作設定啟用鑄造(mint)程序後，transaction即開始進行，按下[View your transaction]可看到執行的結果。一段時間後，即可看到Status: Success的訊息。

Transaction Details

Overview State

[This is a Sepolia Testnet transaction only]

② Transaction Hash: `0xd8b129b96244141728ad6019ab1e7d58079aaa62b693fcb1758cd84fcdfedfc7`

② Status: Success

② Block: 7312454 26 Block Confirmations

② Timestamp: 5 mins ago (Dec-19-2024 05:00:36 PM UTC)

⚡ Transaction Action: Call Set Mint Function by `0x4CE135aB...64E06ae71` on `0x1D237318...651A072F6`

② From: `0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71`

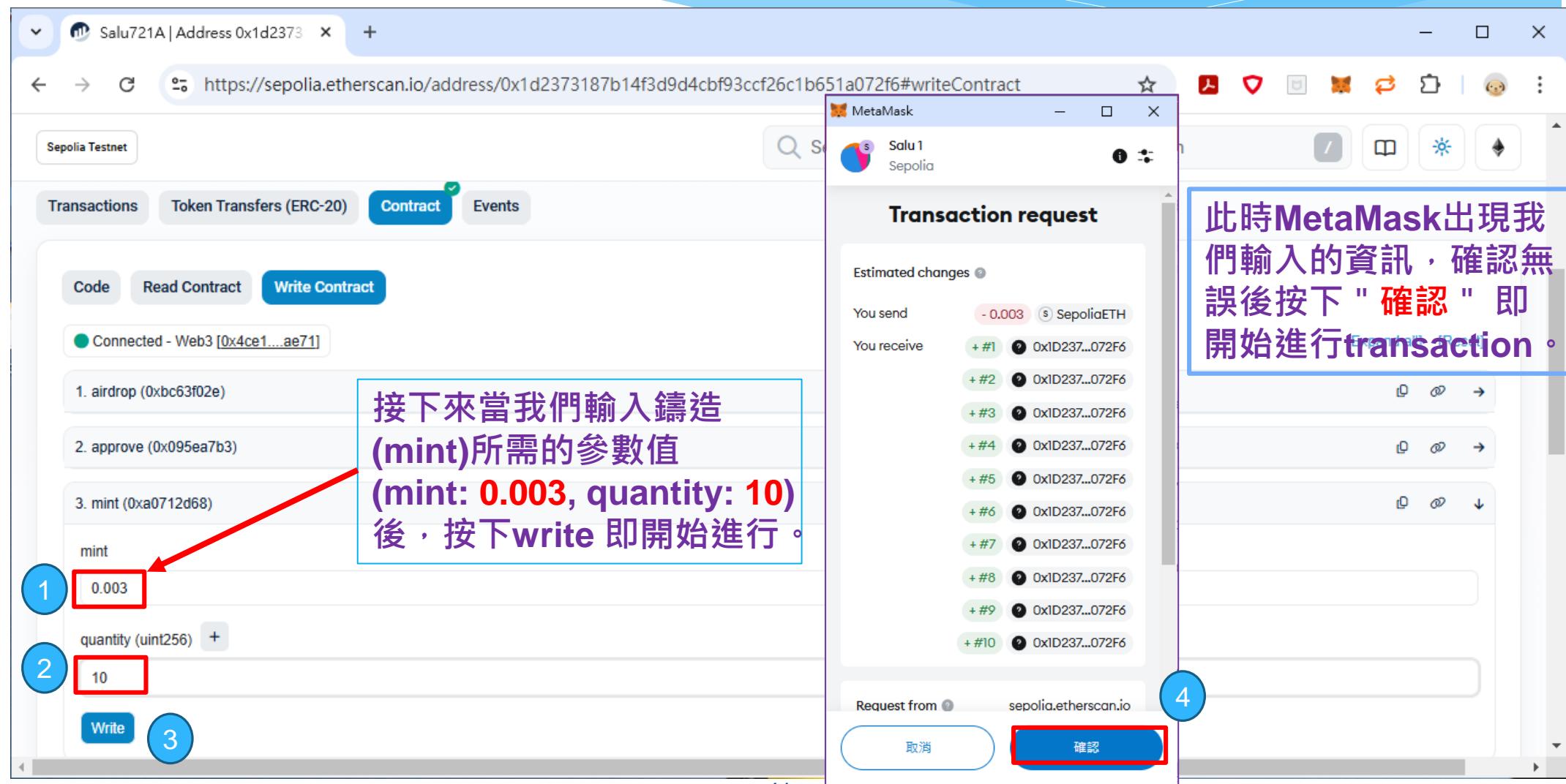
② To: `0x1D237318b14f3D9d4cBF93ccf26C1B651A072F6`

Write Contract – setMint()

剛才的setMint已完成整個transaction

Transaction Hash	Method	Block	Age	From	To	Amount	Txn Fee
0xd8b129b962...	Set Mint	7312454	7 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0016171

Write Contract – mint()



Salu721A | Address 0x1d2373

https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract

Sepolia Testnet

Transactions Token Transfers (ERC-20) Contract Events

Code Read Contract Write Contract

Connected - Web3 [0x4ce1....ae71]

1. airdrop (0xb63f02e)
2. approve (0x095ea7b3)
3. mint (0xa0712d68)

mint
1 0.003
2 10

quantity (uint256) +
3

取消 確認

此時MetaMask出現我們輸入的資訊，確認無誤後按下 "確認" 即開始進行transaction。

Write Contract – mint()

此時可看到**View your transaction**的button出現，代表transaction正在執行中，按下該button來查看transaction執行狀況。

https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract

Write Contract – mint()

The screenshot shows a browser window displaying the Sepolia etherscan transaction details for a mint() call. The transaction hash is `0x83173097056b6cebe03c2893ac6105d3b276b2ec1a50e94036e7d4bfb9af3497`. The transaction action is a Mint function call to address `0x1D237318...651A072F6` from address `0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71`, interacting with `0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6`. The transaction transferred 10 ERC-721 tokens, each from `0x00000000...00000000` to `0x4CE135aB...64E06ae71`, labeled as Salu721A(MILU). The transaction value was 0.003 ETH, with a gas price of 73.804622486 Gwei and a fee of 0.006875343412305816 ETH.

等待片刻後，即可看到如下圖的結果。因為我們輸入**quantity=10**，所以有10個Token鑄造出來。

ERC-721 Token ID [1] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

ERC-721 Token ID [2] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

ERC-721 Token ID [3] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

ERC-721 Token ID [4] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

ERC-721 Token ID [5] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

⋮ Scroll for more

Write Contract – mint()

Contract 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6

Source Code

Overview

ETH BALANCE
0.003 ETH

More Info

CONTRACT CREATOR
0x4CE135aB...64E06ae71 at txn 0x6efe8128a96...

TOKEN TRACKER
Salu721A (MILU)

Multichain Info
N/A

Transactions

Token Transfers (ERC-20)

Contract

Events

剛才的Mint已完成整個transaction

Transaction Hash	Method	Block	Age	From	To	Amount	Txn Fee
0x8317309705...	Mint	7312563	7 hrs ago	0x4CE135aB...64E06ae71	IN 0x1D2373187b14f3d9d4cbf93ccf26c1b651a072F6	0.003 ETH	0.00687534
0xd8b129b962...	Set Mint	7312454	7 hrs ago	0x4CE135aB...64E06ae71	IN 0x1D2373187b14f3d9d4cbf93ccf26c1b651a072F6	0 ETH	0.0016171

Write Contract – mint()

The screenshot shows the Etherscan interface for the Salu721A (MILU) token. The URL in the address bar is sepolia.etherscan.io/token/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The page displays various metrics for the token, including MAX TOTAL SUPPLY (10 MILU), HOLDERS (1), and TOTAL TRANSFERS (10). The Market section shows ONCHAIN MARKET CAP at \$0.00 and CIRCULATING SUPPLY MARKET CAP at -. The Other Info section shows the TOKEN CONTRACT address as [0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6](#). Below this, a large purple box contains the text: "剛才的Mint已有10個Tokens產生". The Transaction History table lists 10 transactions, with the first one highlighted by a red box. The transaction details are: Transaction Hash: 0x8317309705..., Method: Mint, Block: 7312563, Age: 7 hrs ago, From: 0x00000000...00000000, To: 0x4CE135aB...64E06ae71, TokenID: #10.

剛才的Mint已有10個Tokens產生

Transaction Hash	Method	Block	Age	From	To	TokenID
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#10

Write Contract – mint()

Salu721A (MILU) Token Track... +

sepolia.etherscan.io/token/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6

剛才的Mint已有10個Tokens產生

Transaction Hash	Method	Block	Age	From	To	TokenID
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#10
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#9
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#8
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#7
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#6
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#5
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#4
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#3
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#2
0x8317309705...	Mint	7312563	7 hrs ago	0x00000000...00000000	0x4CE135aB...64E06ae71	#1

Write Contract – mint()

The screenshot illustrates the process of writing a Solidity contract function `mint()` on the Sepolia Testnet. The browser window shows the Etherscan interface for the address `0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6`. The "Contract" tab is selected, and the "Write Contract" button is highlighted. Below it, the `mint` function is selected. Two input fields are highlighted with red boxes: "mint" (containing "0") and "quantity (uint256)" (containing "1000"). A large blue callout box contains the text: "接下來我們再次輸入鑄造(mint)所需的參數值 (mint: 0, quantity: 1000) 後，按下write 即開始進行". To the right, two overlapping MetaMask windows show the transaction details. The first window displays a warning: "Be careful: Because of an error, we couldn't check for security alerts. Only continue if you trust every address involved." The second window shows the estimated changes: receiving 11 tokens from address `0x1d237...072F6` for each of the 19 mint operations. The total estimated fee is `0.01823678 SepoliaETH`.

1. airdrop (0xb63f02e)
2. approve (0x095ea7b3)
3. mint (0xa0712d68)

mint
0

quantity (uint256) +
1000

Write
3

接下來我們再次輸入鑄造
(mint)所需的參數值
(mint: 0, quantity: 1000)
後，按下write 即開始進行

Be careful
Because of an error, we couldn't
check for security alerts. Only
continue if you trust every address
involved.
See details
Powered by Blockaid

Estimated changes
You receive + #11 ? 0x1d237...072F6
+ #12 ? 0x1d237...072F6
+ #13 ? 0x1d237...072F6
+ #14 ? 0x1d237...072F6
+ #15 ? 0x1d237...072F6
+ #16 ? 0x1d237...072F6
+ #17 ? 0x1d237...072F6
+ #18 ? 0x1d237...072F6
+ #19 ? 0x1d237...072F6

Estimated fee
Market -60 sec 0.01823678 SepoliaETH
Max fee: 0.05943559 SepoliaETH

4 確認

View Transaction-mint()

The screenshot shows a web browser window for the Sepolia Testnet on etherscan.io. The address bar shows the URL: <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>. The page displays a list of transactions:

- 1. airdrop (0xb63f02e)
- 2. approve (0x095ea7b3)
- 3. mint (0xa0712d68)

Below the transactions, there is a form for the "mint" function:

- mint: 0
- quantity (uint256): + 1000

At the bottom of the form are two buttons: "Write" and "View your transaction". The "View your transaction" button is highlighted with a red border and a blue circle containing the number 1.

A purple callout box with a blue border and white text is overlaid on the page, pointing towards the "View your transaction" button. The text in the callout box reads: 按下View your transaction查看交易情形。

View Transaction-mint()

Sepolia Transaction Hash (Txh) sepolia.etherscan.io/tx/0x9d246b07837bf98ceef48bc43a8396d3d8244e765ef2aaf8081447872371a2aa

[THIS IS A Sepolia Testnet transaction ONLY]

Transaction Hash: 0x9d246b07837bf98ceef48bc43a8396d3d8244e765ef2aaf8081447872371a2aa

Status: Success

Block: 7314713 14 Block Confirmations

Timestamp: 3 mins ago (Dec-20-2024 12:57:12 AM UTC)

Transaction Action: Call Mint Function by 0x4CE135aB...64E06ae71 on 0x1D237318...651A072F6

From: 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71

Interacted With (To): 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6

ERC-721 Tokens Transferred: 1000

ERC-721 Token ID [11] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

ERC-721 Token ID [12] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

ERC-721 Token ID [13] Salu721A(MILU)
From 0x00000000...00000000 To 0x4CE135aB...64E06ae71

稍等片刻後，即可看到交易完成，1000個Tokens產生

View Transaction-mint()

The screenshot shows a web browser window displaying the Etherscan.io interface for a contract at address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The page includes tabs for Source Code, Overview, More Info, Multichain Info, and a navigation bar with various icons.

More Info section details:

- CONTRACT CREATOR: 0x4CE135aB...64E06ae71 at txn 0x6efe8128a96...
- TOKEN TRACKER: Salu721A (MILU)

Transactions section summary: Latest 3 from a total of 3 transactions.

Transaction Hash	Method	Block	Age	From	To	Amount	Txn Fee
0x9d246b0783...	Mint	7314713	7 mins ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0125355
0x8317309705...	Mint	7312563	7 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0.003 ETH	0.00687534
0xd8b129b962...	Set Mint	7312454	8 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0016171

Annotations:

1. 一開始Mint:10個Token · Txn Fee需要0.00687534ETH
2. 第二次Mint:1000個Token · Txn Fee只要0.0125355ETH

Write Contract – transferFrom()

接著執行transferFrom功能進行
Token id owner的轉換，
把Token id : 5，
從from:
0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71
轉到to:
0x7BeeE5F42F617503730d9Fba6117E301EAad8f0C
按下write進行transaction。

View Transaction - transferFrom()

The screenshot shows a web browser window for the Sepolia Testnet. The address bar contains the URL: <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>. The page displays a list of recent transactions:

- 8. setBaseUri (0xa0bcfc7f)
- 9. setMint (0x429ff28d)
- 10. setUriSuffix (0x16ba10e0)
- 11. transferFrom (0x23b872dd)

Below the transaction list, there is a detailed form for viewing the 11. transferFrom transaction:

transferFrom

from (address): 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71

to (address): 0x7BeeE5F42F617503730d9Fba6117E301EAad8f0C

tokenId (uint256): + 5

回到Sepolia Testnet按下View your transaction。

At the bottom left, there are two buttons: "Write" and "View your transaction". The "View your transaction" button is highlighted with a red border.

View Transaction - transferFrom()

The screenshot shows a browser window displaying the Sepolia Testnet transaction details for the URL <https://sepolia.etherscan.io/tx/0x4eb43e1ed17b0486f62f9daa3d65f5e9c995c7cd45e9e95d8b0dc65909839c82>. The transaction hash is 0x4eb43e1ed17b0486f62f9daa3d65f5e9c995c7cd45e9e95d8b0dc65909839c82. The status is Success, and it has 17 Block Confirmations. The transaction action was a Transfer From call to address 0x1D237318...651A072F6. The transaction transferred 5 ERC-721 tokens from address 0x4CE135aB...64E06ae71 to address 0x7BeeE5F4...1EAad8f0C. The transaction fee was 0.00075593506408064 ETH.

[This is a Sepolia Testnet transaction only]

Transaction Hash: 0x4eb43e1ed17b0486f62f9daa3d65f5e9c995c7cd45e9e95d8b0dc65909839c82

Status: Success

Block: 7314835 17 Block Confirmations

Timestamp: 3 mins ago (Dec-20-2024 01:23:36 AM UTC)

Transaction Action: Call Transfer From Function by 0x4CE135aB...64E06ae71 on 0x1D237318...651A072F6

From: 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71

Interacted With (To): 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6 ✓

ERC-721 Tokens Transferred:

ERC-721 Token ID [5] Salu721A(MILU)
From 0x4CE135aB...64E06ae71 To 0x7BeeE5F4...1EAad8f0C

Value: 0 ETH

Transaction Fee: 0.00075593506408064 ETH

確認transaction完成

View Transaction - transferFrom()

The screenshot shows the Etherscan interface for a Sepolia Testnet contract at address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The page displays various details about the contract, including its ETH balance (0.003 ETH) and a token tracker for Salu721A (MILU). The 'Transactions' tab is selected, showing a list of four transactions. The first transaction, which is highlighted with a red box, is a 'Transfer From' operation from 0x4CE135aB...64E06ae71 to 0x1D237318...651A072F6, occurring 6 mins ago in block 7314835. The amount transferred was 0 ETH with a tx fee of 0.00075593.

Transaction Hash	Method	Block	Age	From	To	Amount	Txn Fee
0x4eb43e1ed1...	Transfer From	7314835	6 mins ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.00075593
0x9d246b0783...	Mint	7314713	33 mins ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0125355

Read Contract – ownerOf()

The screenshot shows the Etherscan Sepolia Testnet interface. In the search bar, the URL is `sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#readContract`. On the left, there's a sidebar with tabs for `5. isApprovedForAll`, `6. name`, `7. owner`, `8. ownerOf`, and `tokenId (uint256)`. The `tokenId` field contains the value `5`, which is highlighted with a red box. Below the sidebar, under the `Query` tab, there's a section for `address` with the value `0x7BeeE5F42F617503730d9Fba6117E301EAad8f0C`, also highlighted with a red box. A large blue callout box on the right contains the text: "查詢tokenId=5的owner即為剛才transaction的結果，
owner: 0x7BeeE5F42F617503730d9Fba6117E301EAad8f0C".

Write Contract – airdrop()

進行空投airdrop操作，
quantity=20
空投給
0x0C95bf187eEbbf350ad886c993Fd50C047ED297a

1. airdrop (0xbc63f02e)

quantity (uint256) + 20 1

_receiver (address) 2 0x0C95bf187eEbbf350ad886c993Fd50C047ED297a

Write 3

2. approve (0x095ea7b3)

3. mint (0xa0712d68)

4. renounceOwnership (0x715018a6)

MetaMask Sepolia Salu1 Salu721A https://sepolia.etherscan.io OxD237...072F6 : AIRDROP 1 詳情 HEX Be careful Because of an error, we couldn't check for security alerts. Only continue if you trust every address involved. See details Powered by Blockaid Estimated changes No changes predicted for your wallet Estimated fee 0.00089189 0.00089189 SepoliaETH Market -60 sec Max fee: 0.00249934 SepoliaETH 拒絕 確認 4

View Transaction-Airdrop

The screenshot shows a web browser window for the Sepolia Testnet on etherscan.io. The address bar shows the URL: <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>. The page displays a list of transactions, with the first one being an airdrop. Below the transaction list, there is a "Write Contract" section where a user can input parameters for a new smart contract. A purple callout box highlights the "View your transaction" button.

回到Sepolia Testnet按下
View your transaction

57

<https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>

View Transaction-Airdrop

Sepolia Transaction Hash (Txh) sepolia.etherscan.io/tx/0x1952d00c2616b92aedda9015548efbfbc7bcb961ac9004caf33f6d18c7ab2d6

Search by Address / Txn Hash / Block / Token

Transaction Hash: 0x1952d00c2616b92aedda9015548efbfbc7bcb961ac9004caf33f6d18c7ab2d6

Status: Success

Block: 7314928 16 Block Confirmations

Timestamp: 3 mins ago (Dec-20-2024 01:43:12 AM UTC)

Transaction Action: Call Airdrop Function by 0x4CE135aB...64E06ae71 on 0x1D237318...651A072F6

From: 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71

Interacted With (To): 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6 ✓

ERC-721 Tokens Transferred: 20

ERC-721 Token ID [1011] Salu721A(MILU)
From 0x00000000...00000000 To 0x0C95bf18...047ED297a

ERC-721 Token ID [1012] Salu721A(MILU)
From 0x00000000...00000000 To 0x0C95bf18...047ED297a

ERC-721 Token ID [1013] Salu721A(MILU)
From 0x00000000...00000000 To 0x0C95bf18...047ED297a

確認transaction完成

View Transaction-Airdrop

The screenshot shows a web browser displaying the Etherscan.io interface for a Sepolia Testnet contract at address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The page is titled "Salu721A | Address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6". The main content area is divided into three sections: "Overview", "More Info", and "Multichain Info". The "Overview" section shows an ETH BALANCE of 0.003 ETH. The "More Info" section displays the CONTRACT CREATOR (0x4CE135aB...64E06ae71) and TOKEN TRACKER (Salu721A (MILU)). Below these sections, a "Transactions" tab is selected, showing a table of the latest transactions. The first transaction in the table is highlighted with a red box and labeled "Airdrop". A purple button labeled "查看Txn Fee" (View Txn Fee) is positioned to the right of the transaction table.

Transaction Hash	Method	Block	Age	From	To	Amount	Txn Fee
0x1952d00c26...	Airdrop	7314928	6 mins ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.00060501
0x4eb43e1ed1...	Transfer From	7314835	25 mins ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.00075593
0xd246b0783...	Mint	7314713	52 mins ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0125355

View Transaction-Airdrop

Salu721A (MILU) Token Track

sepolia.etherscan.io/token/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#balances

Search by Address / Txn Hash / Block / Token

Token Salu721A (MILU)

ERC-721

Overview

MAX TOTAL SUPPLY
1,030 MILU

HOLDERS
3

TOTAL TRANSFERS
1,031

Market

ONCHAIN MARKET CAP
\$0.00

CIRCULATING SUPPLY MARKET CAP
-

Other Info

TOKEN CONTRACT
0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6

Transfers Holders Contract

Token Holders Chart

A total of 3 token holders

Download Page Data First < Page 1 of 1 > Last

查看Token holders

Rank	Address	Quantity	Percentage
1	0x4CE135aB...64E06ae71	1,009	97.9612%
2	0x0C95bf18...047ED297a	20	1.9417%
3	0x7BeeE5F4...1EAad8f0C	1	0.0971%



setBaseURI

前置準備事項

- 需先上傳IPFS的images or video檔案，或是上傳至一般的網站。
- 將metadata檔案內的image value指向至已上傳至IPFS的images or video檔案，或是上傳至一般的網站URL。
- 需先上傳pinata IPFS的metadata檔案(延伸檔名有.json或無)，或是上傳至一般的網站。
- 把前面上傳pinata的URL的BaseURI記錄下來，等一下提供給setBaseUri設定用，如下：
 - 1. 延伸檔名無.json：
<https://magenta-retired-roundworm-860.my.pinata.cloud/ipfs/Qmbmr2QqNnL3L5FYMcjkLSD82Pj6aLaEsSPt3uphT6X5F/>
 - 2. 延伸檔名有.json：
<https://magenta-retired-roundworm-860.my.pinata.cloud/ipfs/QmXhNA3b5wqt5nycRRno4uTBFDfxi8CpkmSFk2fFeUJGh/>

因為我們的smart contract code內有指定metadata延伸檔名為.json的檔案，所以要使用上述第2項的URL

Write Contract – setBaseUri()

The screenshot illustrates the workflow for writing a contract to the Sepolia Testnet. It features three main components:

- Browser Tab:** Shows the URL <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract>. The page lists several transaction steps:
 - 6. safeTransferFrom (0xb88d4fde)
 - 7. setApprovalForAll (0xa22cb465)
 - 8. setBaseUri (0xa0bcfc7f)A red box highlights the "uri (string)" input field, which contains the value <https://magenta-retired-roundworm-860.mypinata.cloud/ipfs/QmXhNA3b5wqt5nycRRno4uTBFDfxi8CpkmSFk2fFeUJGh/>. Two numbered circles, 1 and 2, point to this field and the "Write" button respectively.
- MetaMask Extension:** A floating window titled "MetaMask" shows the transaction details:
 - Network: Sepolia
 - From: Salu1
 - To: Salu721A
 - URL: https://sepolia.etherscan.io
 - Transaction ID: 0x1D237...072F6 : SET BASE URI
 - Gas: 0
 - Fee: 0.0009016 SepoliaETH
 - Market - 60 sec
 - Max fee: 0.00265813 SepoliaETHA warning message in the center says: "Be careful: Because of an error, we couldn't check for security alerts. Only continue if you trust every address involved." Buttons for "See details" and "Powered by Blockaid" are also present.
- Bottom Navigation:** A blue bar at the bottom contains two buttons: "拒絶" (Reject) and "確認" (Confirm), with the latter being highlighted by a red border.

View Transaction-setBaseUri()

Salu721A | Address 0x1d2373

sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#writeContract

Sepolia Testnet

Search by Address / Txn Hash / Block / Token

6. safeTransferFrom (0xb88d4fde)

7. setApprovalForAll (0xa22cb465)

8. setBaseUri (0xa0bcfc7f)

uri (string)

<https://magenta-retired-roundworm-860.myipfs.cloud/ipfs/QmXhNA3b5wqtI5nycRRno4uTBFDfxi8CpkmSFk2fFeUJGh/>

Write View your transaction 1

View Transaction-setBaseUri()

The screenshot shows a web browser window displaying the Sepolia etherscan transaction details for a specific transaction hash. The transaction was successful, having received 10 block confirmations. The transaction action was a call to the 'Set Base Uri' function on contract 0x1D237318...651A072F6, from address 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71 to address 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6. The status is marked as 'Success'.

Sepolia Transaction Hash (Txh) sepolia.etherscan.io/tx/0xb039bc5d00160cbd88bf1fb1343e309a6e95c24daa6ad3e92c5f5064240c7789

Transaction Details

Overview Logs (1) State

[This is a Sepolia Testnet transaction only]

② Transaction Hash: 0xb039bc5d00160cbd88bf1fb1343e309a6e95c24daa6ad3e92c5f5064240c7789

② Status: Success

② Block: 7315026 10 Block Confirmations

② Timestamp: 2 mins ago (Dec-20-2024 02:04:12 AM UTC)

.Transaction Action: Call Set Base Uri Function by 0x4CE135aB...64E06ae71 on 0x1D237318...651A072F6

② From: 0x4CE135aB2eB8e482D16B8011ba9415D64E06ae71

② To: 0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6 ✓

View Transaction-setBaseUri()

The screenshot shows the Etherscan.io interface for a Sepolia Testnet contract. The address is 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The transaction history table highlights the first transaction (index 7315026) which performed the 'Set Base Uri' operation.

Transaction Hash	Method	Block	Age	From	To	Amount	Txn Fee
0xb039bc5d00...	Set Base Uri	7315026	1 hr ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.00058928
0x1952d00c26...	Airdrop	7314928	1 hr ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.00060501
0x4eb43e1ed1...	Transfer From	7314835	2 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.00075593
0xd246b0783...	Mint	7314713	2 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0125355
0x8317309705...	Mint	7312563	10 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0.003 ETH	0.00687534
0xd8b129b962...	Set Mint	7312454	10 hrs ago	0x4CE135aB...64E06ae71	0x1D237318...651A072F6	0 ETH	0.0016171

Read Contract-tokenURI()

The screenshot shows the Sepolia Testnet version of the etherscan interface for the address 0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6. The URL in the browser is <https://sepolia.etherscan.io/address/0x1d2373187b14f3d9d4cbf93ccf26c1b651a072f6#readContract>.

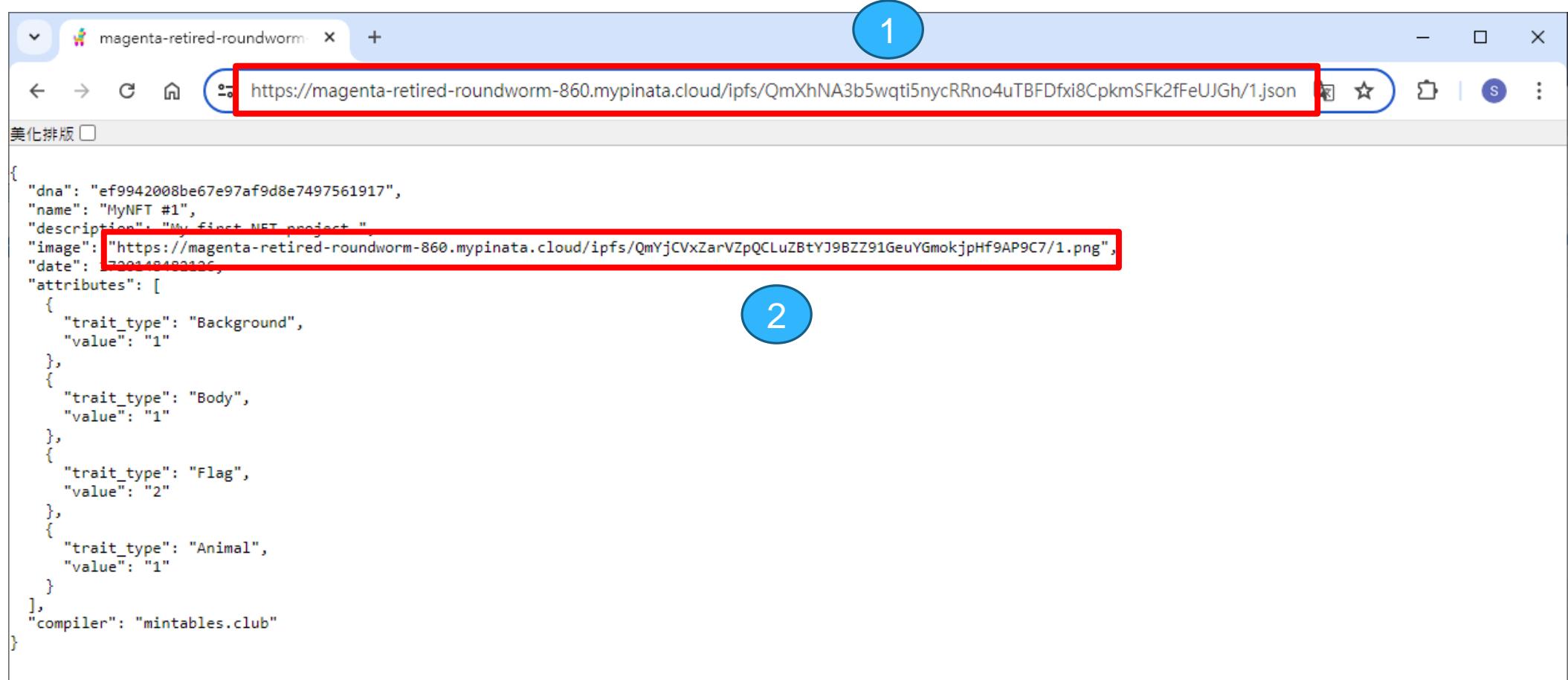
The interface displays the ABI for the contract, specifically the `tokenURI(uint256)` method. The ABI entry is:

```
[ tokenURI(uint256) method Response ]  
  >> string https://magenta-retired-roundworm-860.myipfs.cloud/ipfs/QmXhNA3b5wqt5nycRRno4uTBFDfxi8CpkmsFk2fFeUJGh/1.json
```

Three numbered callouts highlight specific parts of the interface:

- 1**: A red box surrounds the value "1" in the `_tokenId` field, which is highlighted by a blue circle.
- 2**: A blue circle highlights the "Query" button next to the ABI entry, which is also surrounded by a red box.
- 3**: A red box surrounds the `.json` suffix in the `.string` type indicator, which is highlighted by a blue circle.

Token # 1-Metadata



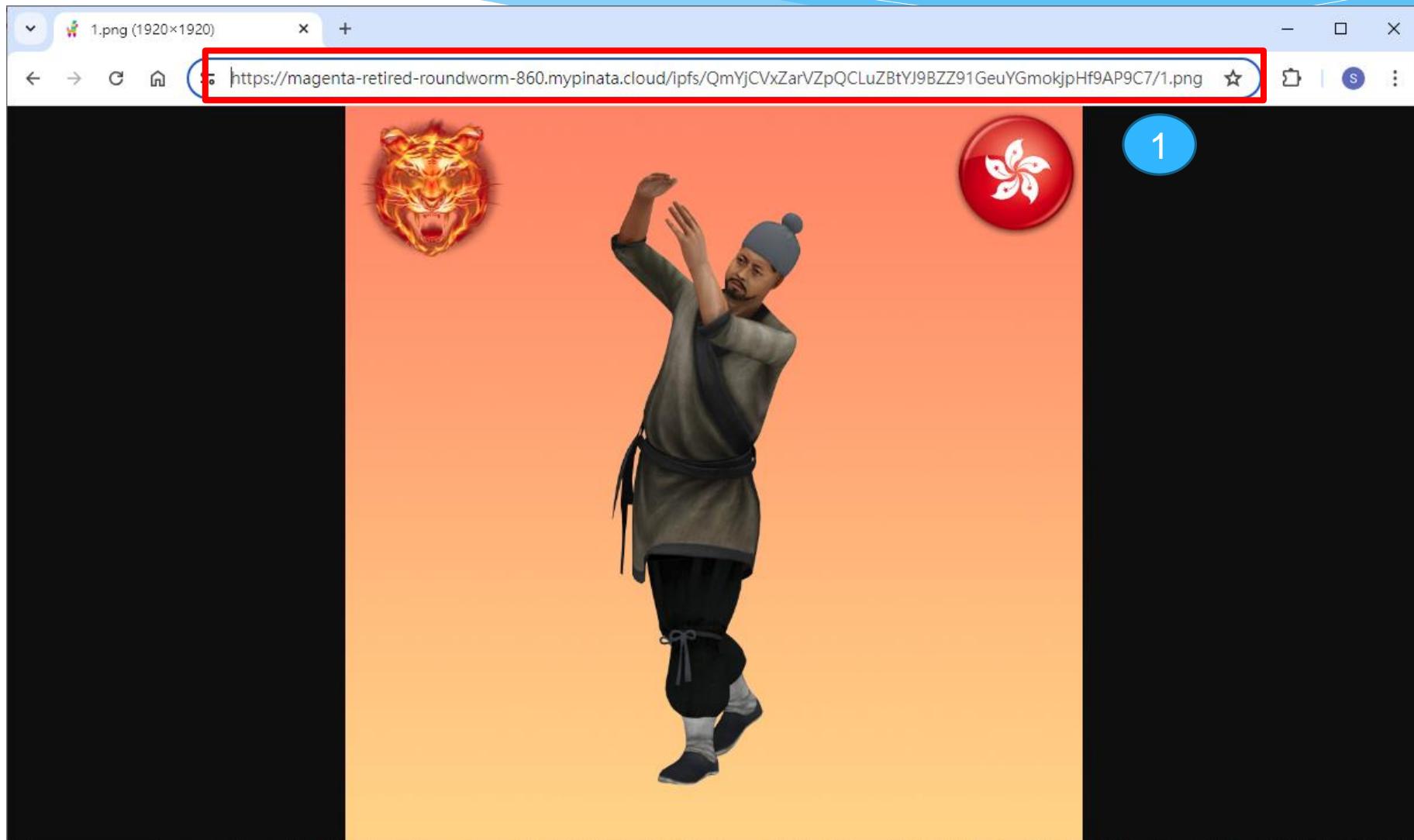
1

https://magenta-retired-roundworm-860.myipinata.cloud/ipfs/QmXhNA3b5wqt5nycRRno4uTBFDfxi8CpkmsFk2fFeUJGh/1.json

2

```
{  
  "dna": "ef9942008be67e97af9d8e7497561917",  
  "name": "MyNFT #1",  
  "description": "My first NFT project.",  
  "image": "https://magenta-retired-roundworm-860.myipinata.cloud/ipfs/QmYjCVxZarVZpQCLuZBtYJ9BZZ91GeuYGmokjpHf9AP9C7/1.png",  
  "date": "2021-01-01T00:00:00Z",  
  "attributes": [  
    {  
      "trait_type": "Background",  
      "value": "1"  
    },  
    {  
      "trait_type": "Body",  
      "value": "1"  
    },  
    {  
      "trait_type": "Flag",  
      "value": "2"  
    },  
    {  
      "trait_type": "Animal",  
      "value": "1"  
    }  
  ],  
  "compiler": "mintables.club"  
}
```

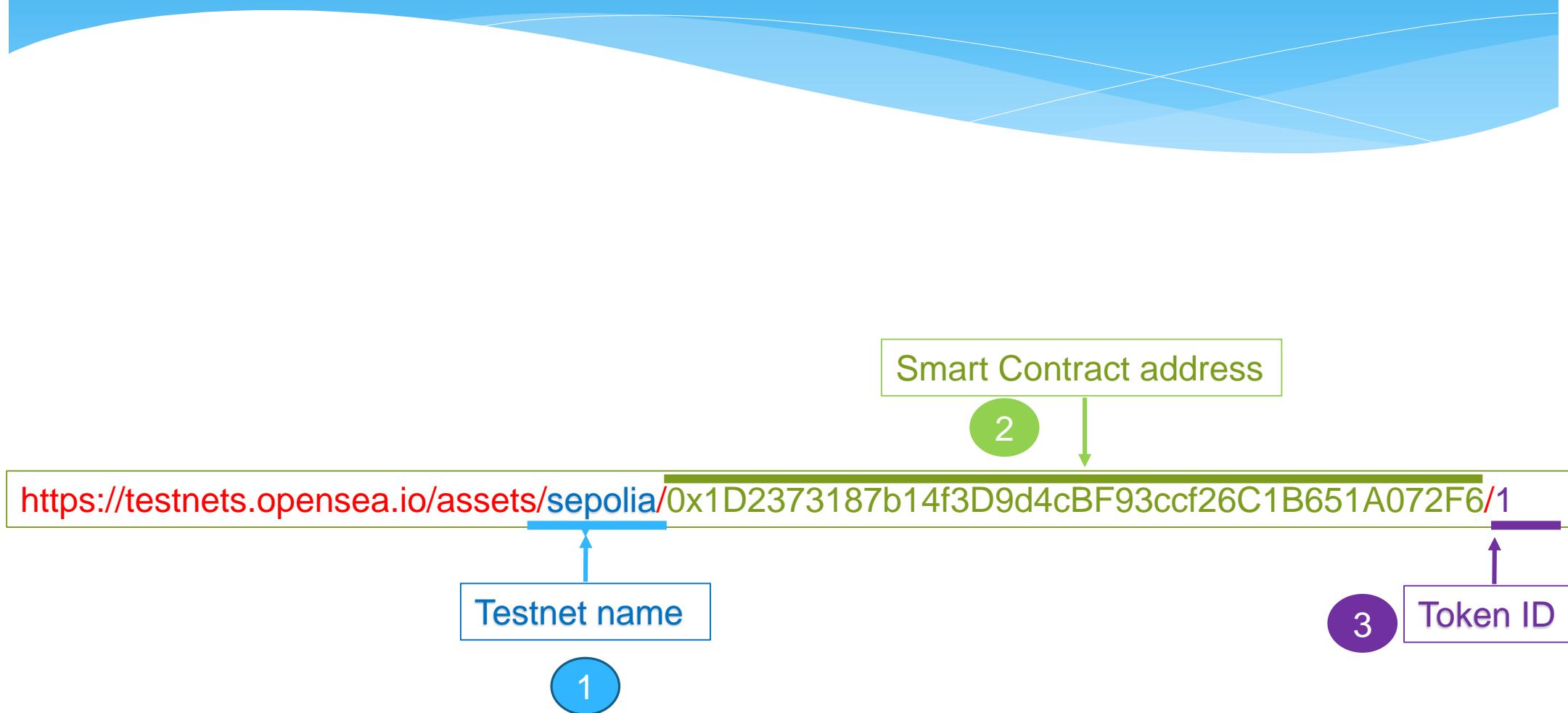
Token # 1-image





OpenSea

OpenSea URL



Token # 1-NFT

1

The screenshot shows a web browser window displaying an NFT listing on the OpenSea Testnets platform. The URL in the address bar is highlighted with a red box and contains the identifier '1'. The main content area shows a digital artwork of a man in traditional Chinese attire performing a dance or martial arts move, set against a gradient orange background. To the left of the figure is a golden tiger head, and to the right is a red circular emblem featuring the Hong Kong flag. The listing details are as follows:

- Name:** MyNFT #1
- Owner:** Salu721A
- Viewed:** 1 view
- Actions:** Make offer, Share, Copy link, More options
- Price History:** No events have occurred yet. Check back later.

The OpenSea navigation bar includes links for Drops, Stats, Create, and a search bar. A login button and a shopping cart icon are also visible.

Token # 1-NFT

The image displays two side-by-side browser windows illustrating the relationship between an NFT's JSON metadata and its listing on a blockchain marketplace.

Left Window (JSON Metadata):

A screenshot of a browser window showing the JSON metadata for "magenta-retired-roundworm-860". The URL is <https://magenta-retired-roundworm-860.my.pinata.cloud/ipfs/QmXhNA3b5wqt5nycRRno4uTBFDfxi8CpkmSFk2fFeUJGh/1.json>. The JSON object includes fields like dna, name, description, image, date, attributes (with trait types: Background, Body, Flag, Animal), and compiler. A red box highlights the "description" field: "My first NFT project." Another red box highlights the "attributes" section, which contains four trait objects: Background (value 1), Body (value 1), Flag (value 2), and Animal (value 1).

Right Window (OpenSea Listing):

A screenshot of the OpenSea platform showing the listing for "MyNFT #1 - Salu721A". The URL is <https://testnets.opensea.io/assets/sepolia/0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6/1>. The listing details include the description "By 4CE135" and "My first NFT project." A red box highlights this description. Below it, the "Traits" section shows four categories: ANIMAL (1 0.10%, Floor: --), BACKGROUND (1 0.10%, Floor: --), BODY (1 0.10%, Floor: --), and FLAG (2 0.10%, Floor: --). These traits correspond to the ones defined in the JSON metadata.

Page Footer:

73 <https://magenta-retired-roundworm-860.my.pinata.cloud/ipfs/QmXhNA3b5wqt5nycRRno4uTBFDfxi8CpkmSFk2fFeUJGh/1.json> <https://testnets.opensea.io/assets/sepolia/0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6/1>

Token # 1-NFT

1

MyNFT #1 - Salu721A | OpenSea

testnets.opensea.io/assets/sepolia/0x1D2373187b14f3D9d4cBF93ccf26C1B651A072F6/1

OpenSea Testnets

Drops Stats Create Search

Traits

ANIMAL	BACKGROUND	BODY
1 0.10%	1 0.10%	1 0.10%
Floor: --	Floor: --	Floor: --

FLAG
2 0.10%
Floor: --

About Salu721A

This collection has no description yet.

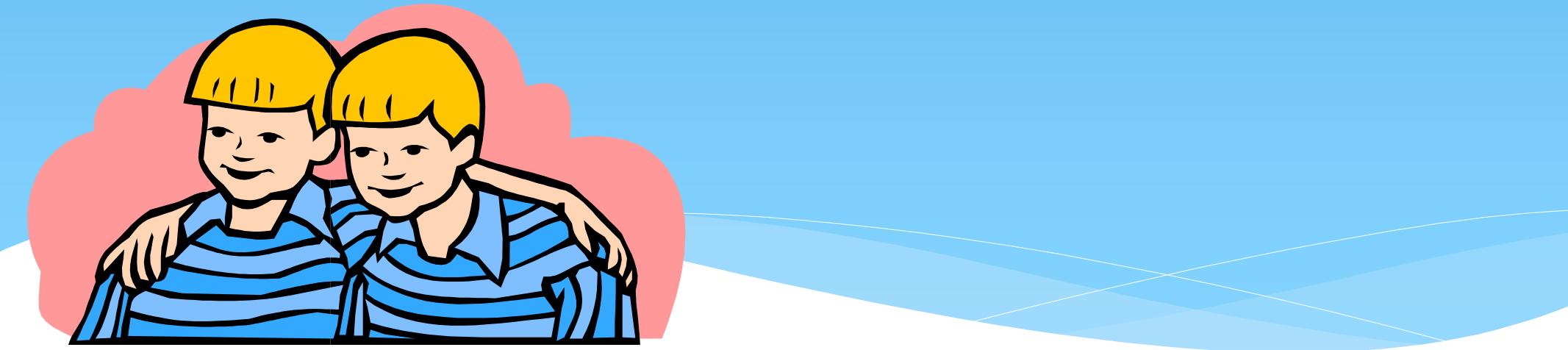
Details

Contract Address	0x1d23...72f6
Token ID	1
Token Standard	ERC-721
Chain	Sepolia
Last Updated	5 seconds ago
Creator Earnings ⓘ	0%

Offers

metadata內的其他
資料

Thank you !



References

References

■ MetaMask

<https://github.com/MetaMask/metamask-extension>

■ Remix

<https://github.com/ethereum/browser-solidity>

■ Openzeppelin

<https://docs.openzeppelin.com/>

<https://github.com/OpenZeppelin/openzeppelin-contracts>

■ ERC721A

<https://www.erc721a.org/>

<https://github.com/chiru-labs/ERC721A>

<https://chiru-labs.github.io/ERC721A/#/>

References

■ Ethereum

<https://github.com/ethereum/>

<https://github.com/ethereum/go-ethereum>

<https://ethereum.org/en>

<https://geth.ethereum.org/docs/fundamentals/private-network>

■ Solidity Documentation

<https://solidity.readthedocs.io>

<https://docs.soliditylang.org/en/v0.8.28/>

■ Smart Contract

<https://www.quicknode.com/guides/tags/ethereum>

https://bshare.io/nft/erc20_721_1155/