OECD International Academy for Tax Crime Investigation

Anti-Money Laundering: Current Trends, Prosecutions, and the Challenges around Cryptocurrencies

OECD

Ethereum Blockchain Explorers

ETHEREUM 101

Ethereum Basics: Ether

- Ether (ETH) is a cryptocurrency, just like Bitcoin
- Ethereum uses a blockchain to store transactions.
- All transactions on the Ethereum blockchain are public.
- Ethereum addresses can hold balances and require authorization (typically in the form of private keys) to spend from them
- Unlike Bitcoin, Ethereum transactions send exact amounts from one address to another.

Ethereum Basics: Smart Contracts

- The Ethereum network can store and run programs.
- Ethereum has a programming languages that enable the creation of:
  - Fungible tokens (i.e. cryptocurrencies)
  - Non-fungible tokens (e.g. Bored Apes)
  - Smart contracts (i.e. computer programs)
  - DeFi Platforms (i.e. financial services programs)
- Ethereum addresses typically store their owner's ether as well as their tokens.

Information displayed by Ethereum Blockchain Explorers

- **Block information**: dates, times and transactions
- **Transaction information**:
  - Amounts of Ethereum transferred
  - Tokens transferred
  - Senders and recipients
  - Dates and times
- **Ethereum Address information:**
  - Balances
  - Token holdings & activity
  - Address type: Contract Account or Externally Owned Account (EOA)

Some Ethereum Blockchain Explorers

- **Etherscan** - English, Chinese, Korean, Russian, and Japanese
- Etherchain
- Ethplorer - English, Chinese, Spanish, French, Turkish, Russian, Korean and Vietnamese
- Blockchair - English, Spanish, French, Italian, Dutch, Portuguese, Russian, Chinese, and Farsi
- Blockscout
- OKLink
- Otterscan

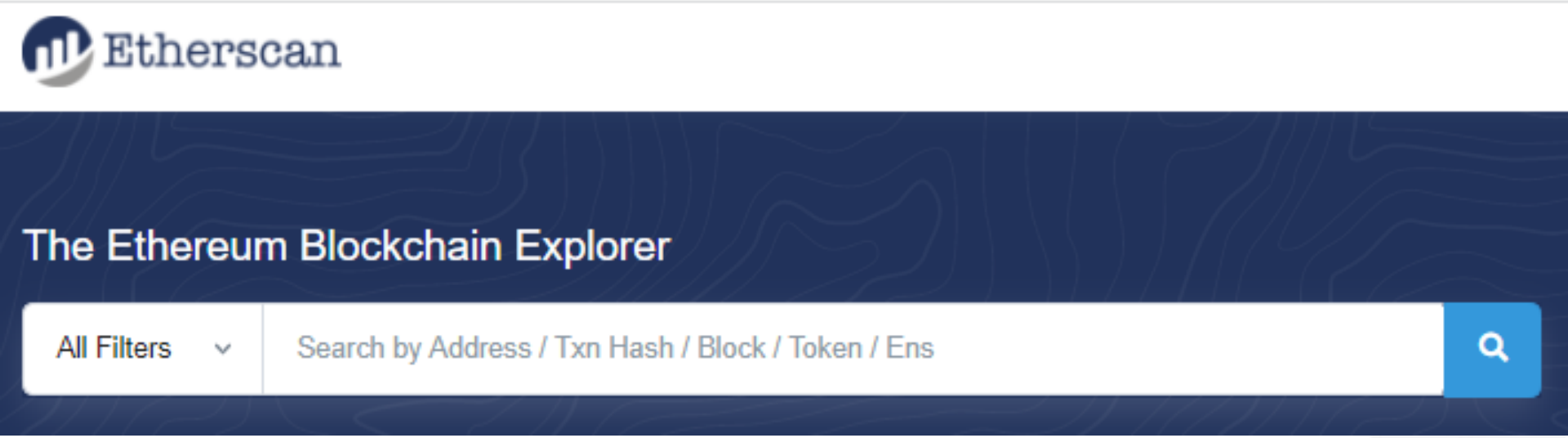
Important features

- What language do they support?
- Do they present information clearly?
- Is the information that they contain comprehensive?
- Do they allow you to export information (e.g. in CSV files)
- Do they allow you to identify an address' Ethereum based assets?
- How comprehensive is the list of tokens/projects that they identify?
- Timeline graphics?

The most popular Ethereum Blockchain Explorer

ETHERSCAN.IO

Etherescan - Search



- Ethereum Address
- Transaction Hash
- Block number
- Ethereum Name Service name (ENS)

https://etherscan.io/

ETHERSCAN ADDRESSES

Two Ethereum Address Types

Externally Owned Accounts

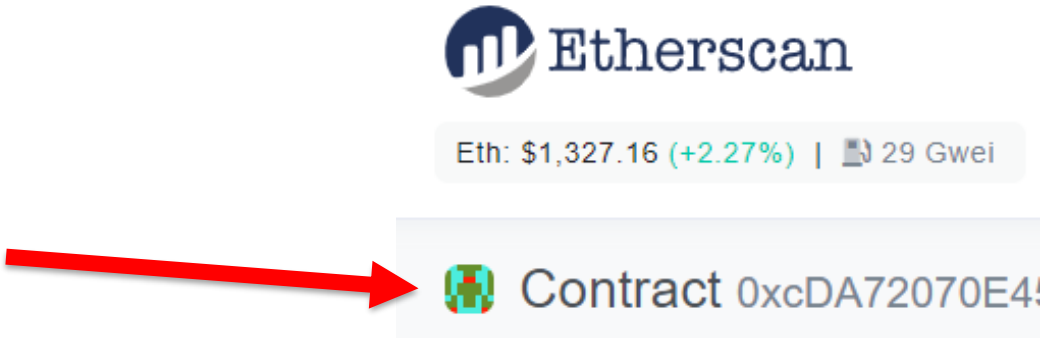
- May have an ETH balance
- No associated code
- Can initiate transactions
- Ability to send crypto is controlled by private keys

Contract Accounts

- May have an ETH balance
- **Has associated code**
- The code is initiated by transactions or messages from other addresses
- Its code must be deployed by another address

Contract Accounts

- Contract accounts are identified in Etherscan by the word Contract.
- Contracts must be deployed by other contracts
  - Tracing the deployer account may help you identify who is behind the smart contract's project (e.g. Bored Ape Yacht Club)



Etherscan Addresses/Accounts

- The Address page will tell you:
  - The address type (Contract or EOA)
  - The address deployer (if it is a Contract address)
  - The address' ETH balance
  - Warning information about the address

Exercise
Etherscan Address

https://etherscan.io/

Search for the following Address:

0x3DD59DE66e2AD31A7D663Df977Ddd6E5F2a5F6b6

1. Is the address a Contract or an EOA?
2. What is the balance of the address?
3. What name has the address been given by Etherscan?
4. Click on some transaction hashes:
    1. Can you identify any Ether being moved **into** the address?
    2. What type of NFTs did the address transfer?

0x09c09debf819f373543…	Transfer	13891474	2021-12-28 3:57:41	0x29adaa4bbef7f689f5e…	IN	Fake_Phishing5028	65 Ether
0x8d058bf03ca4c2cdb0c…	Safe Transfer Fr…	13905788	2021-12-30 9:08:07	Fake_Phishing5028	OUT	Bored Ape Yacht Club: B…	0 Ether
0xae14a1d1bbb58300cd…	Safe Transfer Fr…	13905774	2021-12-30 9:05:46	Fake_Phishing5028	OUT	Bored Ape Yacht Club: B…	0 Ether
0x60b8344dffcbd186e6b…	Safe Transfer Fr…	13905763	2021-12-30 9:04:23	Fake_Phishing5028	OUT	Bored Ape Yacht Club: B…	0 Ether
0xd04cdbf4ff97aaea265…	Safe Transfer Fr…	13905759	2021-12-30 9:02:26	Fake_Phishing5028	OUT	Bored Ape Yacht Club: B…	0 Ether
0x8dd950b4b568b1a6b2…	Safe Transfer Fr…	13905759	2021-12-30 9:02:26	Fake_Phishing5028	OUT	Bored Ape Yacht Club: B…	0 Ether

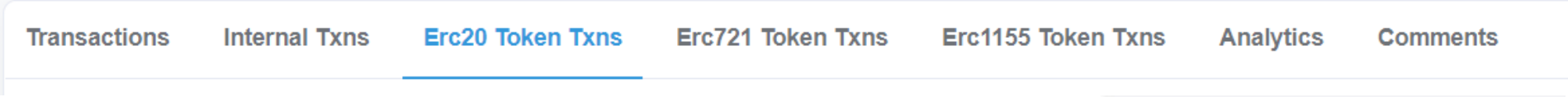
ETHERSCAN TRANSACTIONS

Some Basic Transaction Types

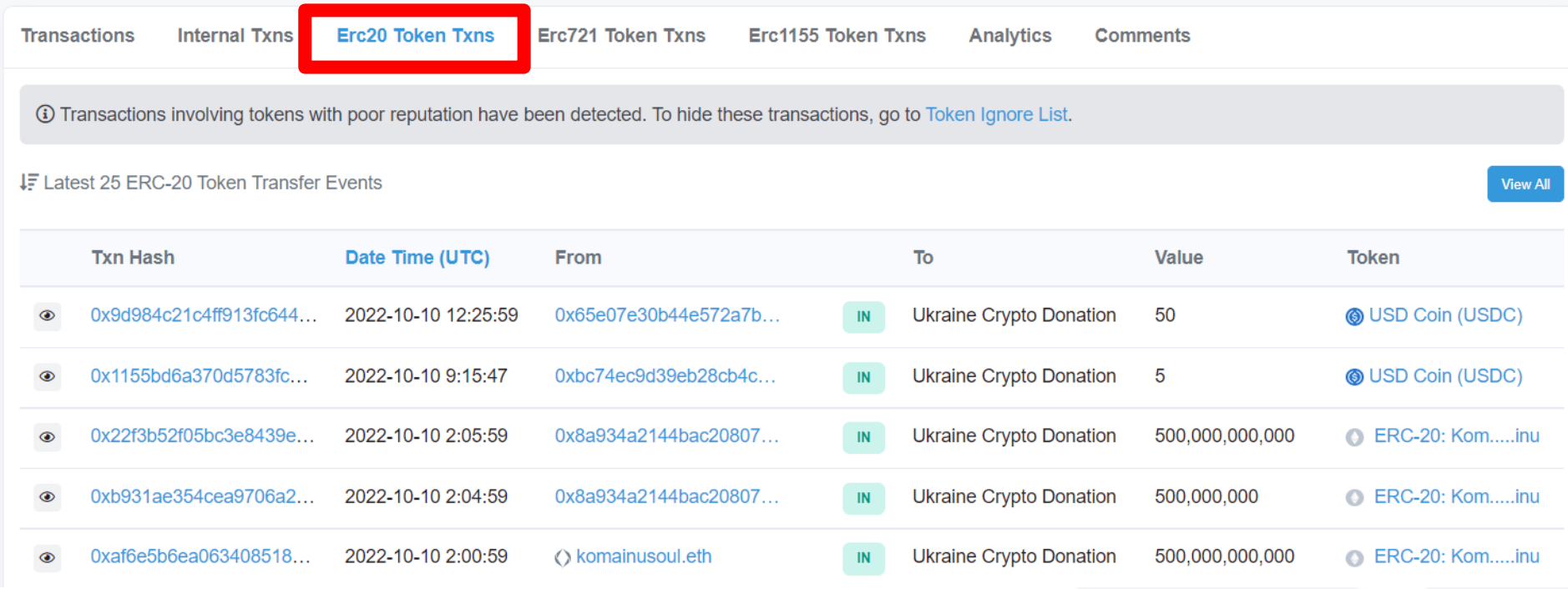
1. **Simple ETH transfer**
   - Moves ETH from one account to another
   - Requires payment of a fee
2. **Simple Token Transfer**
   - Moves a token from one account to another
   - Requires a fee payment as well as interaction with the token's smart contract
3. **Transfer using a Smart Contract**
   - Initiated by another address (EOA or Contract)
   - Requires fee payment as well as interaction with smart contracts

Etherscan Transactions

- You can search for a specific transaction using its hash.
- You can view an address' different types of token transfers
  - ERC20 fungible tokens
  - ERC721 NFTs
  - ERC1155 tokens (multiple token types)
- You can view the address' activity timeline



ERC20 - Cryptocurrency



Transactions | Internal Txns | Erc20 Token Txns | Erc721 Token Txns | Erc1155 Token Txns | Analytics | Comments

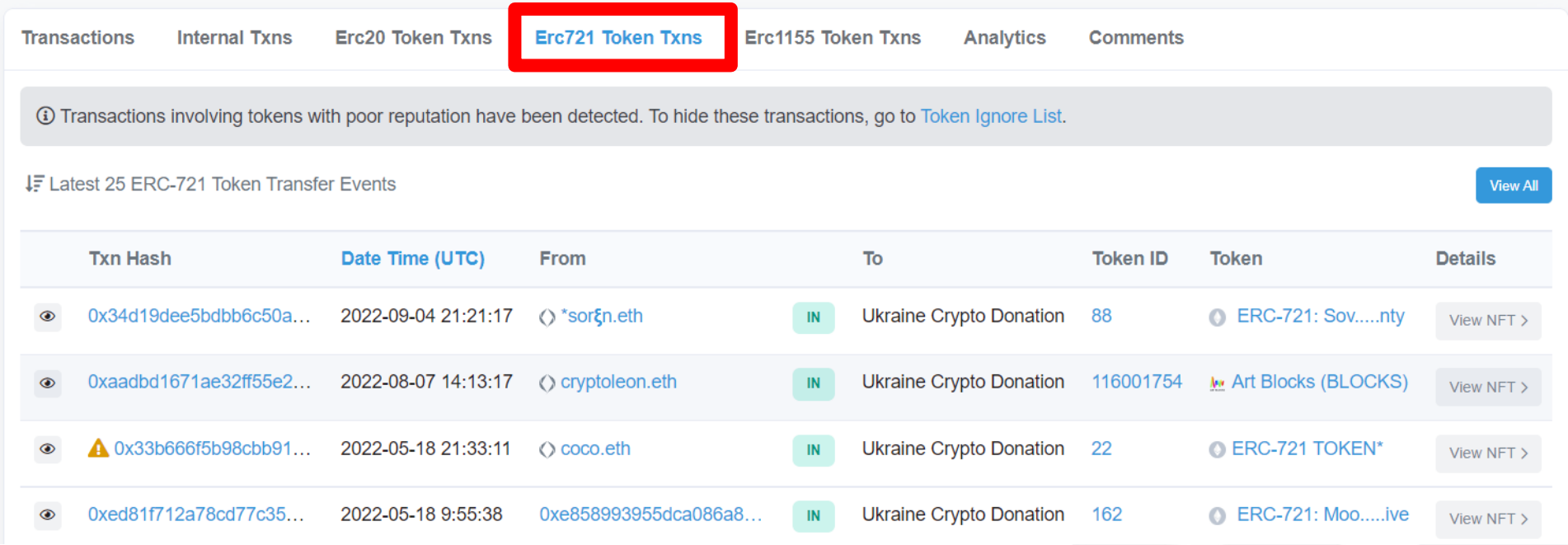
ⓘ Transactions involving tokens with poor reputation have been detected. To hide these transactions, go to Token Ignore List.

Latest 25 ERC-20 Token Transfer Events — View All

Txn Hash	Date Time (UTC)	From		To	Value	Token
0x9d984c21c4ff913fc644…	2022-10-10 12:25:59	0x65e07e30b44e572a7b…	IN	Ukraine Crypto Donation	50	USD Coin (USDC)
0x1155bd6a370d5783fc…	2022-10-10 9:15:47	0xbc74ec9d39eb28cb4c…	IN	Ukraine Crypto Donation	5	USD Coin (USDC)
0x22f3b52f05bc3e8439e…	2022-10-10 2:05:59	0x8a934a2144bac20807…	IN	Ukraine Crypto Donation	500,000,000,000	ERC-20: Kom.....inu
0xb931ae354cea9706a2…	2022-10-10 2:04:59	0x8a934a2144bac20807…	IN	Ukraine Crypto Donation	500,000,000	ERC-20: Kom.....inu
0xaf6e5b6ea063408518…	2022-10-10 2:00:59	komainusoul.eth	IN	Ukraine Crypto Donation	500,000,000,000	ERC-20: Kom.....inu

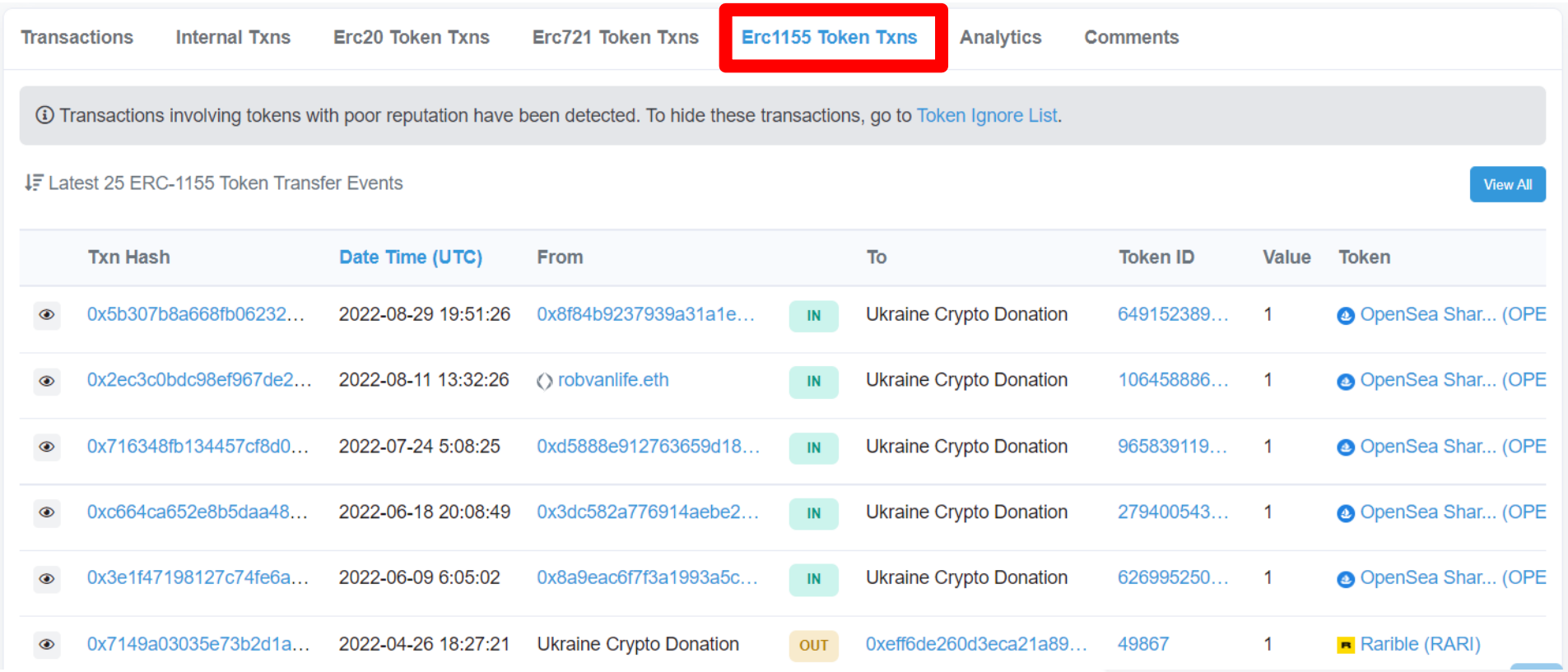
0x165CD37b4C644C2921454429E7F9358d18A45e14

ERC721 - NFT



0x165CD37b4C644C2921454429E7F9358d18A45e14

ERC1155 - Multitoken



Transactions | Internal Txns | Erc20 Token Txns | Erc721 Token Txns | **Erc1155 Token Txns** | Analytics | Comments

Transactions involving tokens with poor reputation have been detected. To hide these transactions, go to Token Ignore List.

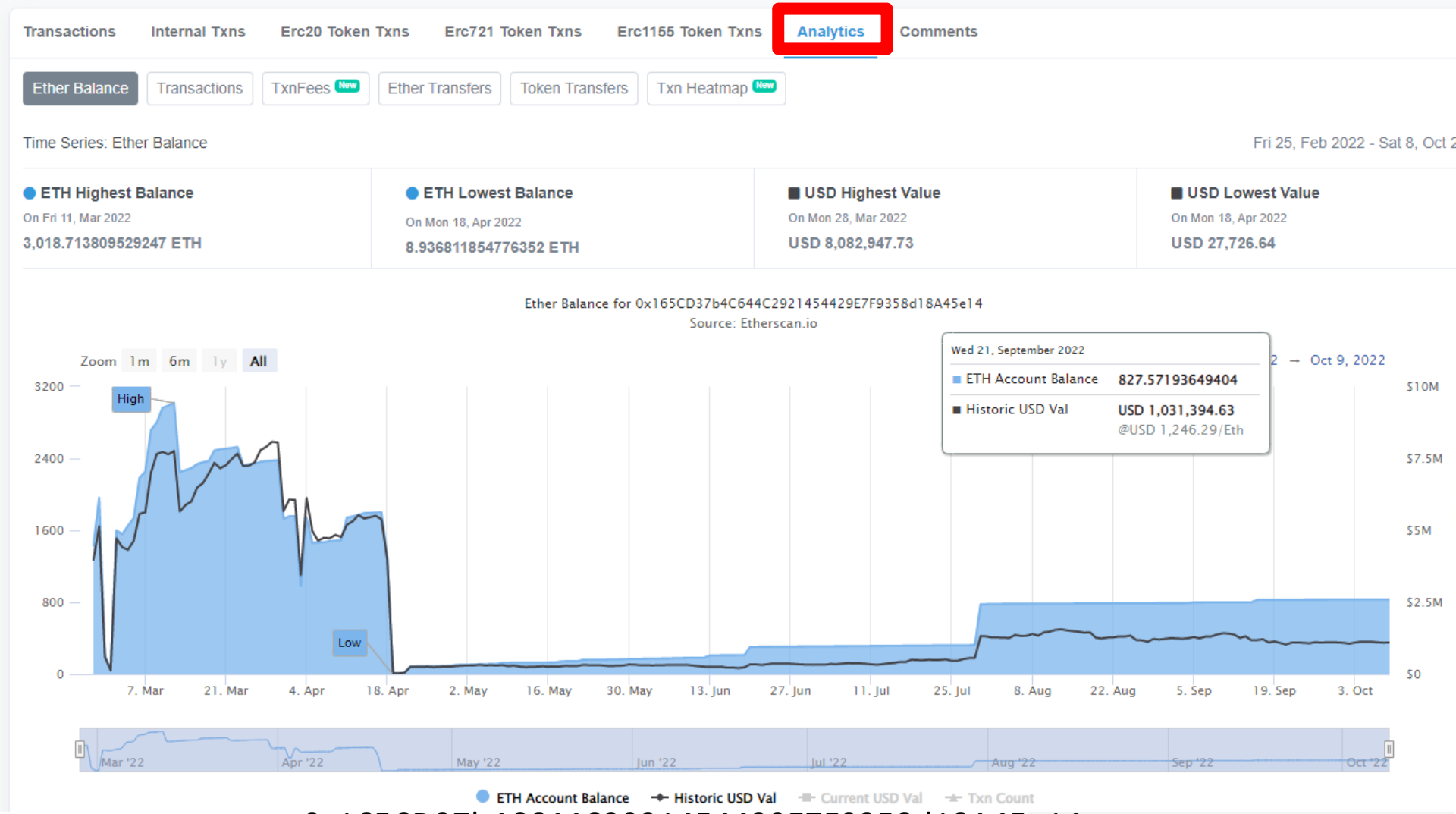
Latest 25 ERC-1155 Token Transfer Events — View All

Txn Hash	Date Time (UTC)	From		To	Token ID	Value	Token
0x5b307b8a668fb06232…	2022-08-29 19:51:26	0x8f84b9237939a31a1e…	IN	Ukraine Crypto Donation	649152389…	1	OpenSea Shar... (OPE
0x2ec3c0bdc98ef967de2…	2022-08-11 13:32:26	robvanlife.eth	IN	Ukraine Crypto Donation	106458886…	1	OpenSea Shar... (OPE
0x716348fb134457cf8d0…	2022-07-24 5:08:25	0xd5888e912763659d18…	IN	Ukraine Crypto Donation	965839119…	1	OpenSea Shar... (OPE
0xc664ca652e8b5daa48…	2022-06-18 20:08:49	0x3dc582a776914aebe2…	IN	Ukraine Crypto Donation	279400543…	1	OpenSea Shar... (OPE
0x3e1f47198127c74fe6a…	2022-06-09 6:05:02	0x8a9eac6f7f3a1993a5c…	IN	Ukraine Crypto Donation	626995250…	1	OpenSea Shar... (OPE
0x7149a03035e73b2d1a…	2022-04-26 18:27:21	Ukraine Crypto Donation	OUT	0xeff6de260d3eca21a89…	49867	1	Rarible (RARI)

0x165CD37b4C644C2921454429E7F9358d18A45e14

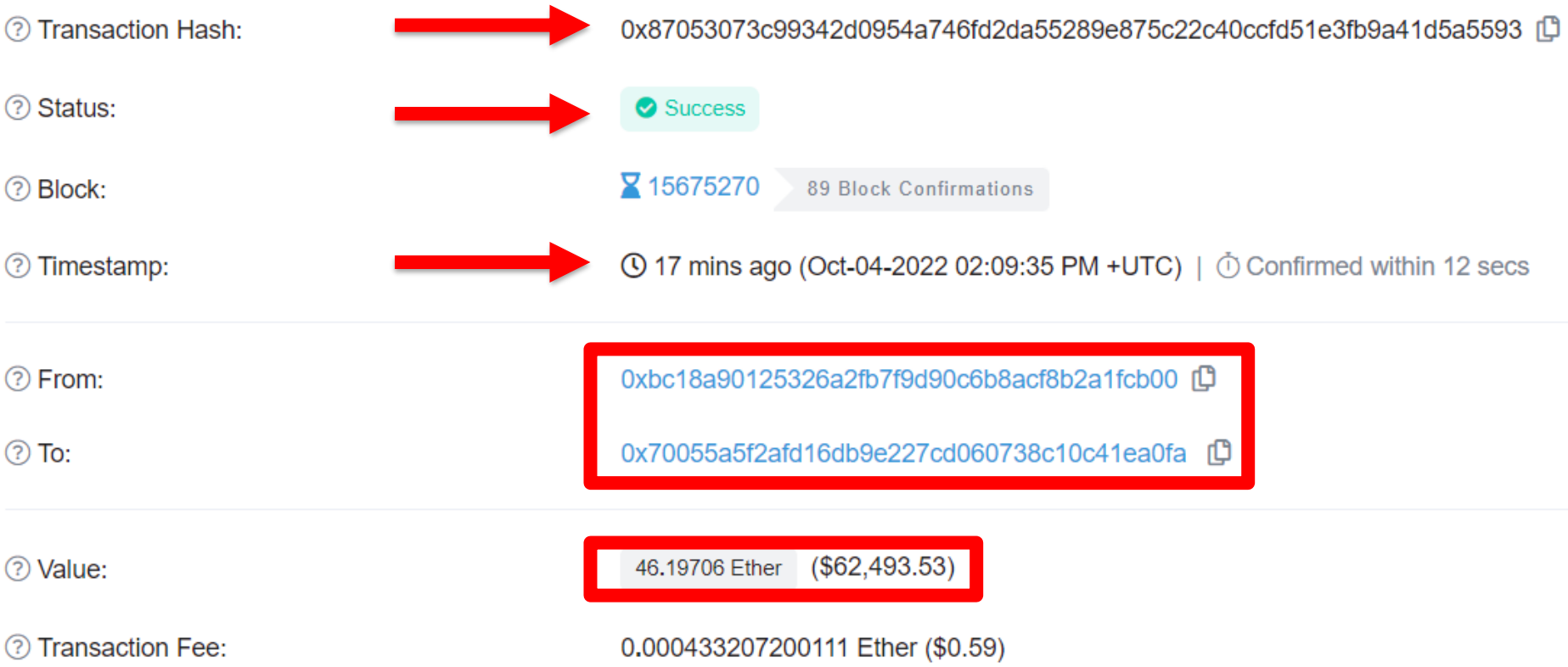
Analytics - Timeline

https://etherscan.io/

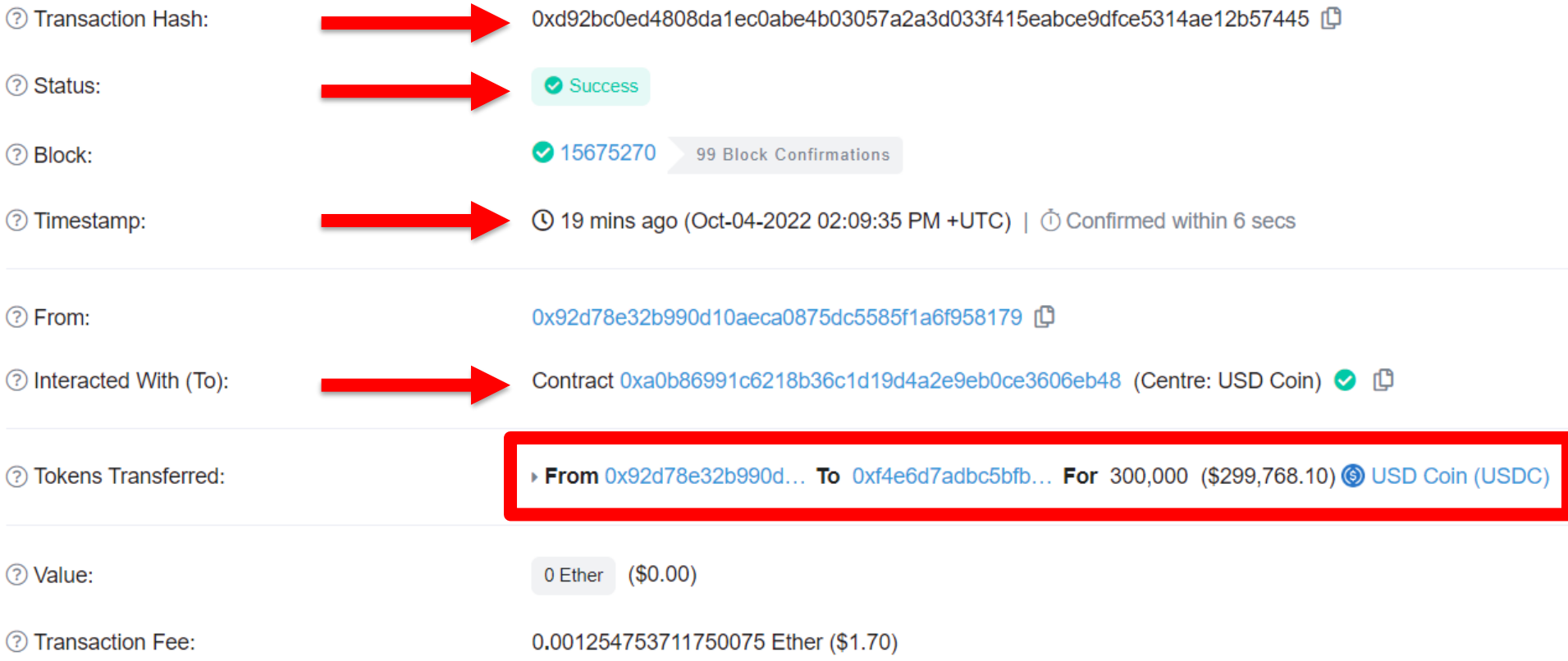


0x165CD37b4C644C2921454429E7F9358d18A45e14

Ethereum (ETH) Transfer



ERC20 (cryptocurrency token) Transfer

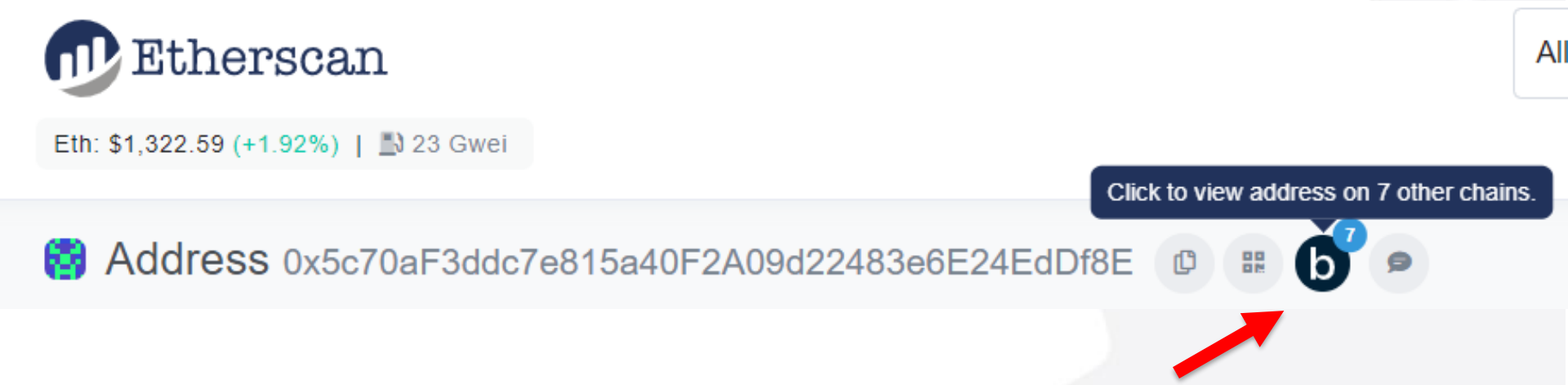


ERC721 (NFT) Transfer

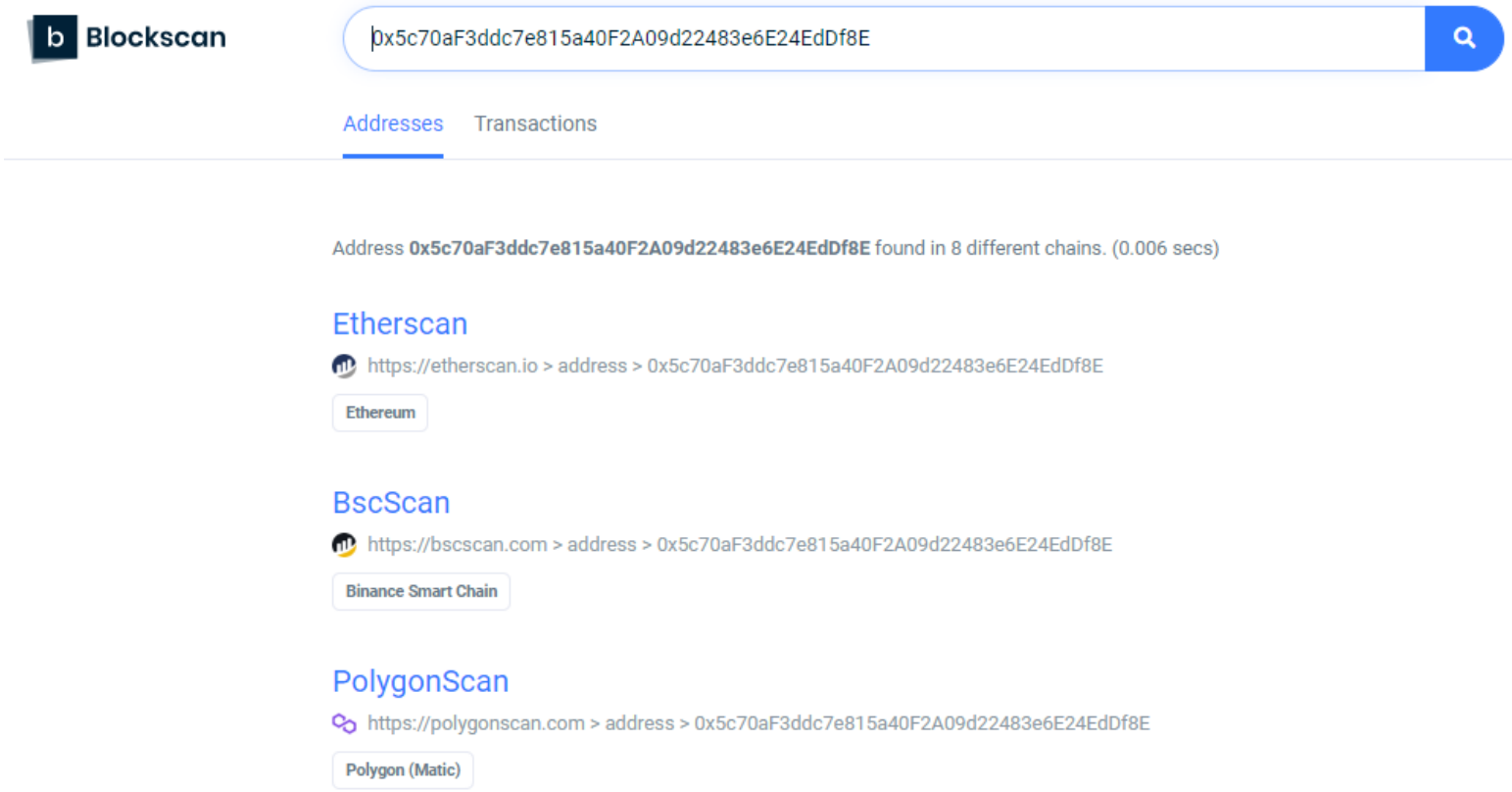
Transaction Hash:	0xa96d317f2482fcf6e0e36b95eb5c187e1fcf1a952888d1c34a082739041fc995
Status:	Success
Block:	13857167 1818210 Block Confirmations
Timestamp:	285 days 17 hrs ago (Dec-22-2021 08:34:36 PM +UTC) | Confirmed within 30 secs
Transaction Action:	Transfer of BoredApeYach... (BAYC) From 0xdea569c1536cd4b0d7… To 0x0434d93484d66fe90d… 1 of Token ID [3550]
From:	0xdea569c1536cd4b0d749e189221e9b41a320c97a
Interacted With (To):	Contract 0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d (Bored Ape Yacht Club: BAYC Token)
Tokens Transferred:	**From** 0xdea569c1536cd… **To** 0x0434d93484d66… For ERC-721 Token ID [3550] BoredApeYach... (BAYC)
Value:	0 Ether ($0.00)
Transaction Fee:	0.011086380380564046 Ether ($15.00)

Transactions on other Chains?

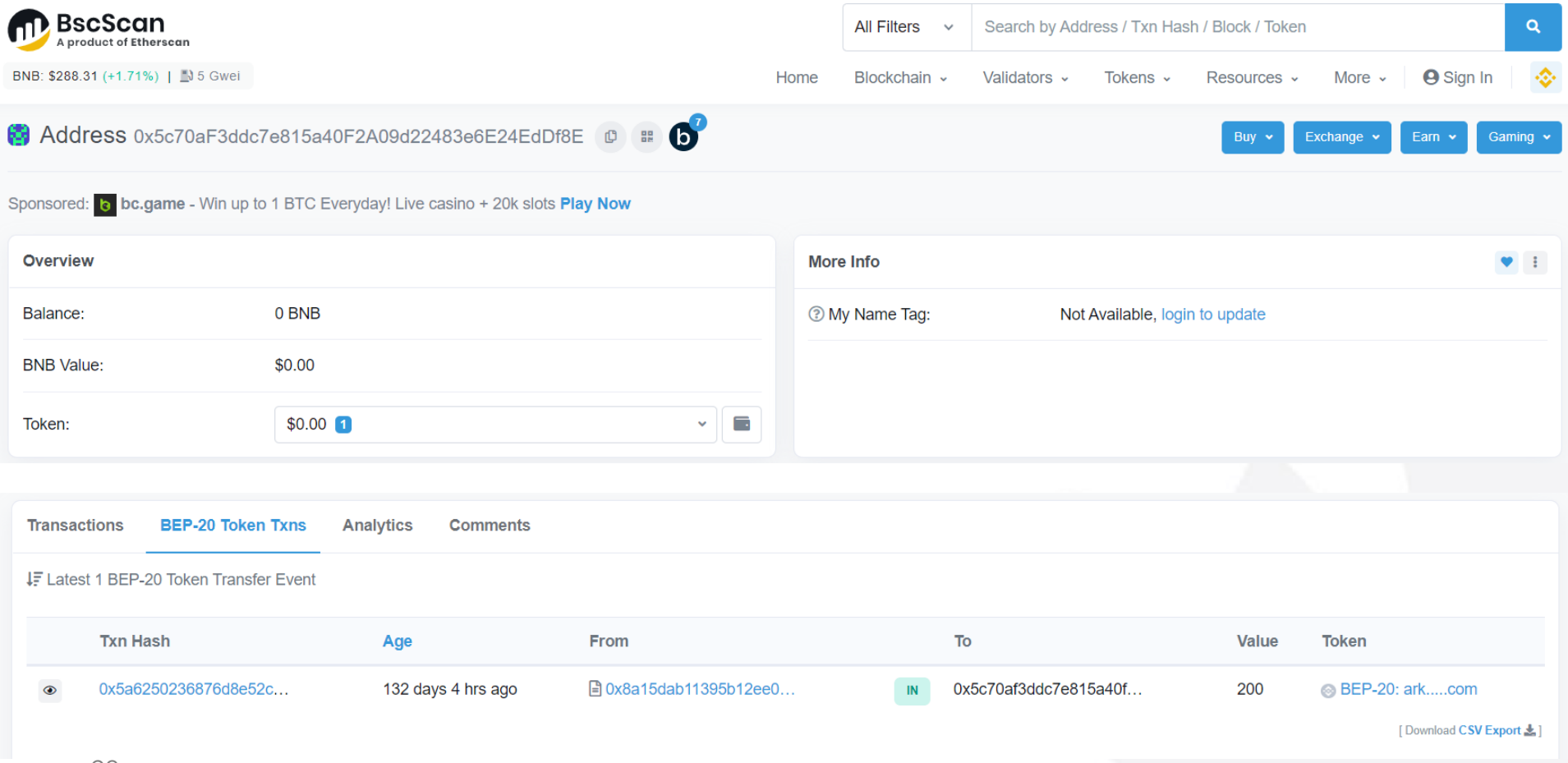
- Etherscan will show you if an address conducted on other chains such as the Binance Smart Chain (BSC), Polygon, or other chains.
  - This can lead you to additional assets as well as an extended transaction history.



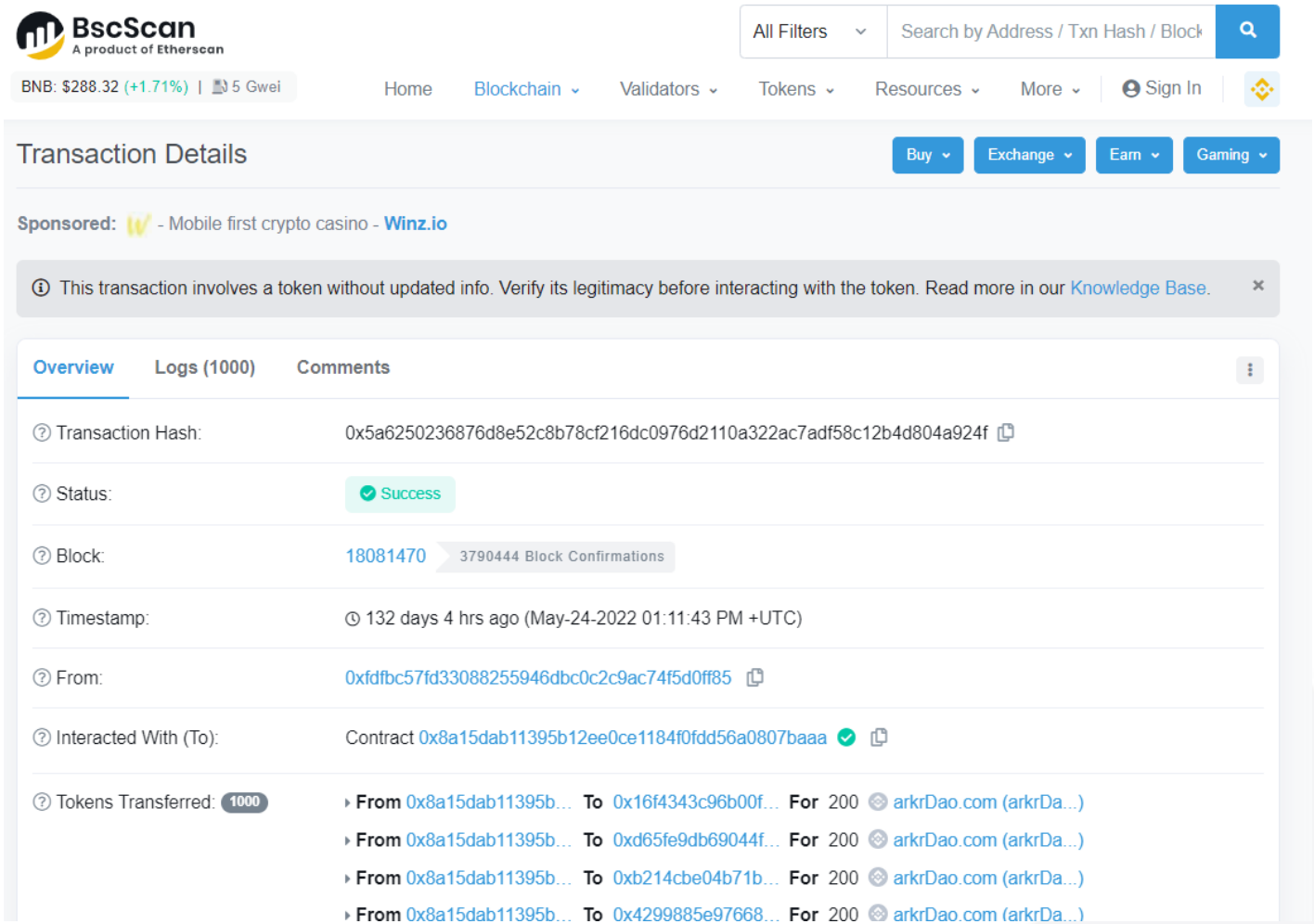
Clicking on the “b” link will bring up Blockscan



Clicking on the Blockscan links will bring up the address in a blockchain explorer for the selected chain



You can then examine the address' transactions on the other blockchain



Etherscan Transaction Exercise

https://etherscan.io/

Search for the following transaction ID:
0xbfad81c48e7853d9f26752823390bed1d99a3b16cb9314122f0d68cd20efd656

1. What is the date and time of the transaction?
2. What was transferred in this transaction?
3. How much was transferred?
4. What was the gas fee?
5. Which address sent the tokens?
6. Which address received the tokens?
7. What types of addresses are the senders and the recipients (Contract or EOA)?

Overview | State | Comments

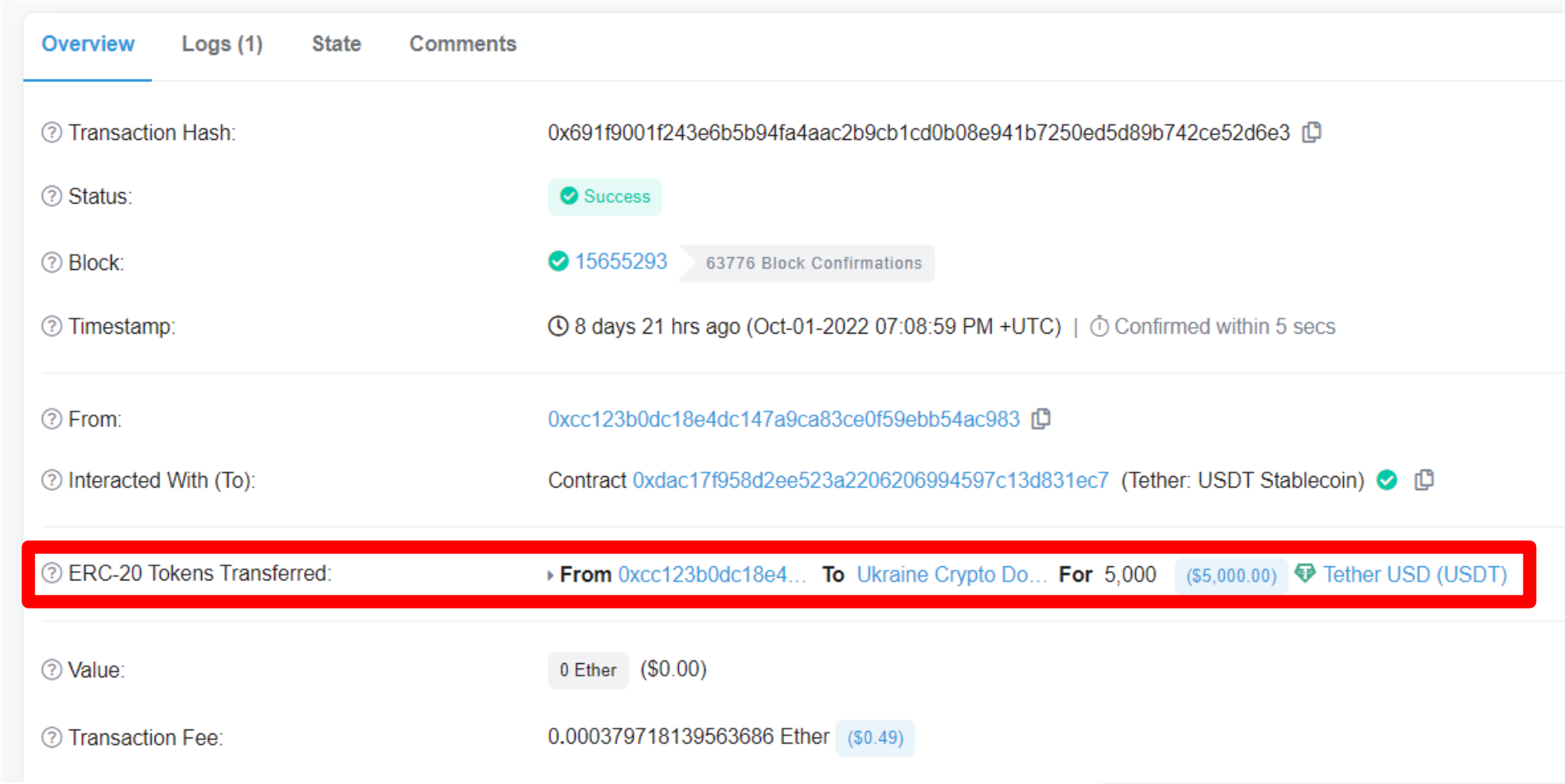
Transaction Hash:	0xbfad81c48e7853d9f26752823390bed1d99a3b16cb9314122f0d68cd20efd656
Status:	Success
Block:	15675270 43752 Block Confirmations
Timestamp:	6 days 2 hrs ago (Oct-04-2022 02:09:35 PM +UTC) | Confirmed within 8 mins:11 secs
From:	0x347607fa6313ae68db5da038791587a31e6c49cb
To:	0x5f203f646f8633844ee8a239b00b7be49745614f
Value:	0.028330955161565 Ether ($36.83)
Transaction Fee:	0.0004074 Ether ($0.53)
Gas Price:	0.0000000194 Ether (19.4 Gwei)
Ether Price:	$1,361.90 / ETH

Etherscan Transaction Exercise

https://etherscan.io/

Search for transaction ID:
0x691f9001f243e6b5b94fa4aac2b9cb1cd0b08e941b7250ed5d89b742ce52d6e3

1. What was the date and time of the transaction?
2. What type of token was transferred?
3. What address were the transferred from?
4. What address were they transferred to?


Overview
Logs (1)
State
Comments
Transaction Hash:
0x691f9001f243e6b5b94fa4aac2b9cb1cd0b08e941b7250ed5d89b742ce52d6e3
Status:
Success
Block:
15655293
63776 Block Confirmations
Timestamp:
8 days 21 hrs ago (Oct-01-2022 07:08:59 PM +UTC) | Confirmed within 5 secs
From:
0xcc123b0dc18e4dc147a9ca83ce0f59ebb54ac983
Interacted With (To):
Contract 0xdac17f958d2ee523a2206206994597c13d831ec7 (Tether: USDT Stablecoin)
ERC-20 Tokens Transferred:
From 0xcc123b0dc18e4... To Ukraine Crypto Do... For 5,000 ($5,000.00) Tether USD (USDT)
Value:
0 Ether ($0.00)
Transaction Fee:
0.000379718139563686 Ether ($0.49)

Etherscan Transaction Exercise

https://etherscan.io/

Search for the following transaction ID:
0x0332696b0dfc2b5a1a6ab4f6e1d4ca269da70bd3346078a68fea70f386888fa9

1. What is the date and time of the transaction?
2. What type of token was transferred?
3. Which token was transferred (TokenID#)?
4. What address was the token transferred from?
5. What address was the token transferred to?
6. What smart contract address mediated the transaction?

Overview | Logs (2) | State | Comments

Transaction Hash: 0x0332696b0dfc2b5a1a6ab4f6e1d4ca269da70bd3346078a68fea70f386888fa9

Status: Success

Block: 14479338 1239753 Block Confirmations

Timestamp: 195 days 11 hrs ago (Mar-29-2022 05:56:17 AM +UTC) | Confirmed within 46 secs

Transaction Action: Transfer of BoredApeYach... (BAYC) From 0xb83c2fd4c54df286bfffb... To 0x8aec189750b04a544e...
1 of Token ID [3771]

From: 0xb83c2fd4c54df286bfffbc1c2d41e5ef46ae0407

Interacted With (To): Contract 0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d (Bored Ape Yacht Club: BAYC Token)

ERC-721 Tokens Transferred: From 0xb83c2fd4c54df2... To 0x8aec189750b04...
For ERC-721 Token ID [3771] BoredApeYach... (BAYC)

Value: 0 Ether ($0.00)

ETHERSCAN AND NFTs

Etherscan & NFTs

- Etherscan allows you to search for individual NFTs and will display their history of their sales as well as their transfers.
- A simple sale will include:
  - A transfer of ETH from the buyer to the seller.
  - A transfer of the NFT from the seller to the buyer.
- Transfers may become more complex if the sales or transfers are made through marketplaces or decentralized platforms.
- When NFTs are stolen no sale transaction takes place – the NFT is just transferred.

Etherscan URLs

- A fast way to get information on specific tokens is to query Etherscan directly with a URL.
- The URL will take you directly to the information you need.
- Simply clicking on links may not get you to the information page that you are looking for (e.g. one containing an image of the NFT).
- You need to know:
  - The token contract address
  - The token ID number

https://etherscan.io/token/<CONTRACT_ADDRESS>/<TOKEN_NUMERIC_ID#>
List of and links to all transactions conducted involving a specific token.

Some Useful URLS

https://etherscan.io/token/<CONTRACT_ADDRESS>?a=<TOKEN_NUMERIC_ID#>
List of and links to all transactions conducted involving a specific token.

https://etherscan.io/nft/<CONTRACT_ADDRESS>/<TOKEN_NUMERIC_ID#>
Image of NFT, owner, transactions involving the NFT.

https://etherscan.io/address/<ADDRESS>#tokentxnsErc721
List of all the ERC-721 token transfers conducted by an address.

https://etherscan.io/tokentxns-nft?a=<ADDRESS>
List of all the ERC-721 token transfers conducted by an address.

URL Exercise

- Search for Bored Ape token 1035
  - **Contract:** 0xBC4CA0EdA7647A8aB7C2061c2E118A18a936f13D
  - **Numeric ID:** 1035
- What does it look like?
- How many transactions has it been involved in?
- Who owns it at the moment?
- What was the last sale price?

https://etherscan.io/token/<CONTRACT_ADDRESS>?a=<TOKEN_NUMERIC_ID#>

https://etherscan.io/nft/<CONTRACT_ADDRESS>/<TOKEN_NUMERIC_ID#>

Token BoredApeYachtClub

NFT

Buy Exchange Earn Gaming

Sponsored: Fairspin Birthday Tournament! **Play and win a new Tesla Model 3 and 7,000,000 TFS!**

Overview

TokenID:	**1035**
Transfers:	2

Profile Summary [Edit] More

Contract:	0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d
Official Site:	https://boredapeyachtclub.com/
Social Profiles:	

Ad

AAX Savings Marathon
Up to 300,000 USDT Rewards in 42 Days.

Transfers | Inventory | Info | NFT Trades | Contract | Comments

TokenID: 1035

A total of 2 transactions found

First Page 1 of 1 Last

	Txn Hash	Method	Date Time (UTC)	From		To	TokenID	Details
	0x566c0ea7f96db0ba76...	Transfer From	2021-05-01 4:05:16	adaugelli.eth	→	0x4117f96a6c700eb2f84...	1035	View NFT
	0x15a0bd6ec5f8be1c55...	Mint Ape	2021-05-01 3:33:18	Null Address: 0x000...000	→	adaugelli.eth	1035	View NFT

Last Sale (Contract)

85 ETH ($110,792.40)

URL Exercise

- Search for Autoglyph token 509
  - **Contract:** 0xd4e4078ca3495DE5B1d4dB434BEbc5a986197782
  - **Numeric ID:** 509
- What does it look like?
- How many transactions has it been involved in?
- Who owns it at the moment?
- What was the last sale price?

https://etherscan.io/token/<CONTRACT_ADDRESS>?a=<TOKEN_NUMERIC_ID#>

https://etherscan.io/nft/<CONTRACT_ADDRESS>/<TOKEN_NUMERIC_ID#>

Token Autoglyphs

Art NFT

Sponsored: Fairspin Birthday Tournament! **Play and win a new Tesla Model 3 and 7,000,000 TFS!**

Overview

TokenID:	**509**
Transfers:	6

Autoglyph #509

Autoglyphs

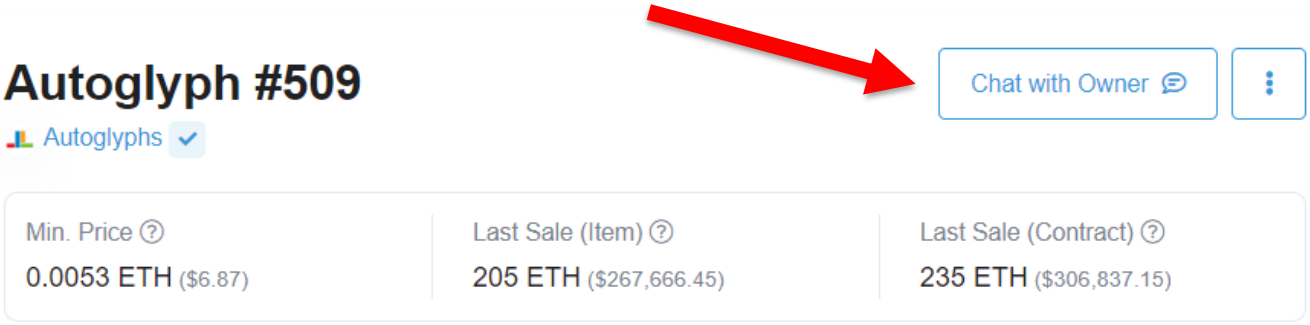
Chat with Owner

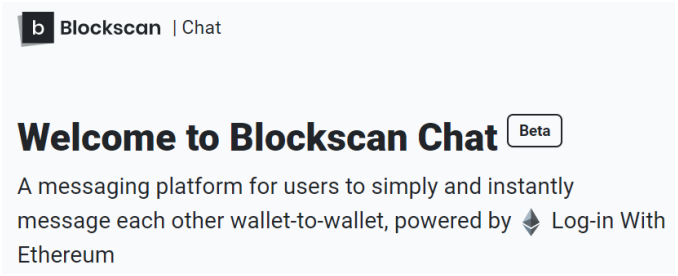
Min. Price	Last Sale (Item)	Last Sale (Contract)
0.0053 ETH ($6.87)	205 ETH ($267,666.45)	235 ETH ($306,837.15)

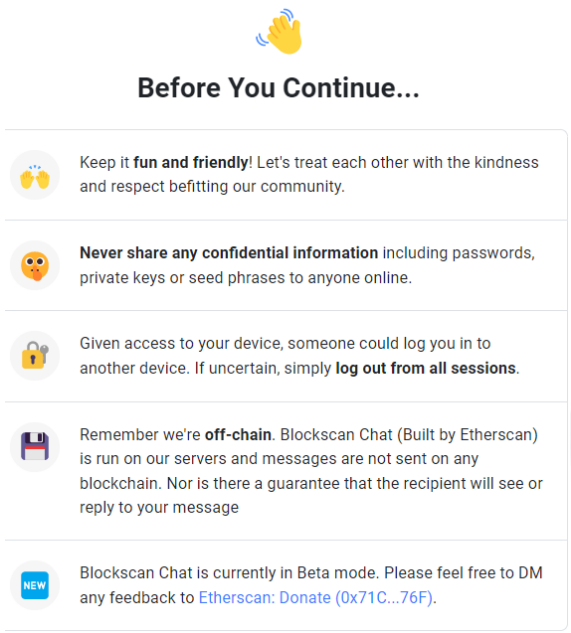
Details

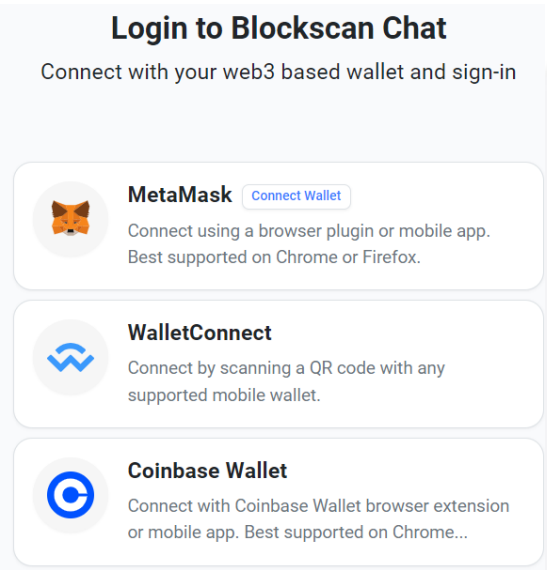
Owner:	0xef764bac8a438e7e498c2e5fccf0f174c3e3f8db
Contract Address:	0xd4e4078ca3495DE5B1d4dB434BEbc5a986197782
Creator:	Autoglyphs: Deployer
Token ID:	509
Token Standard:	ERC-721
Marketplaces:	

You can now chat with the owner!



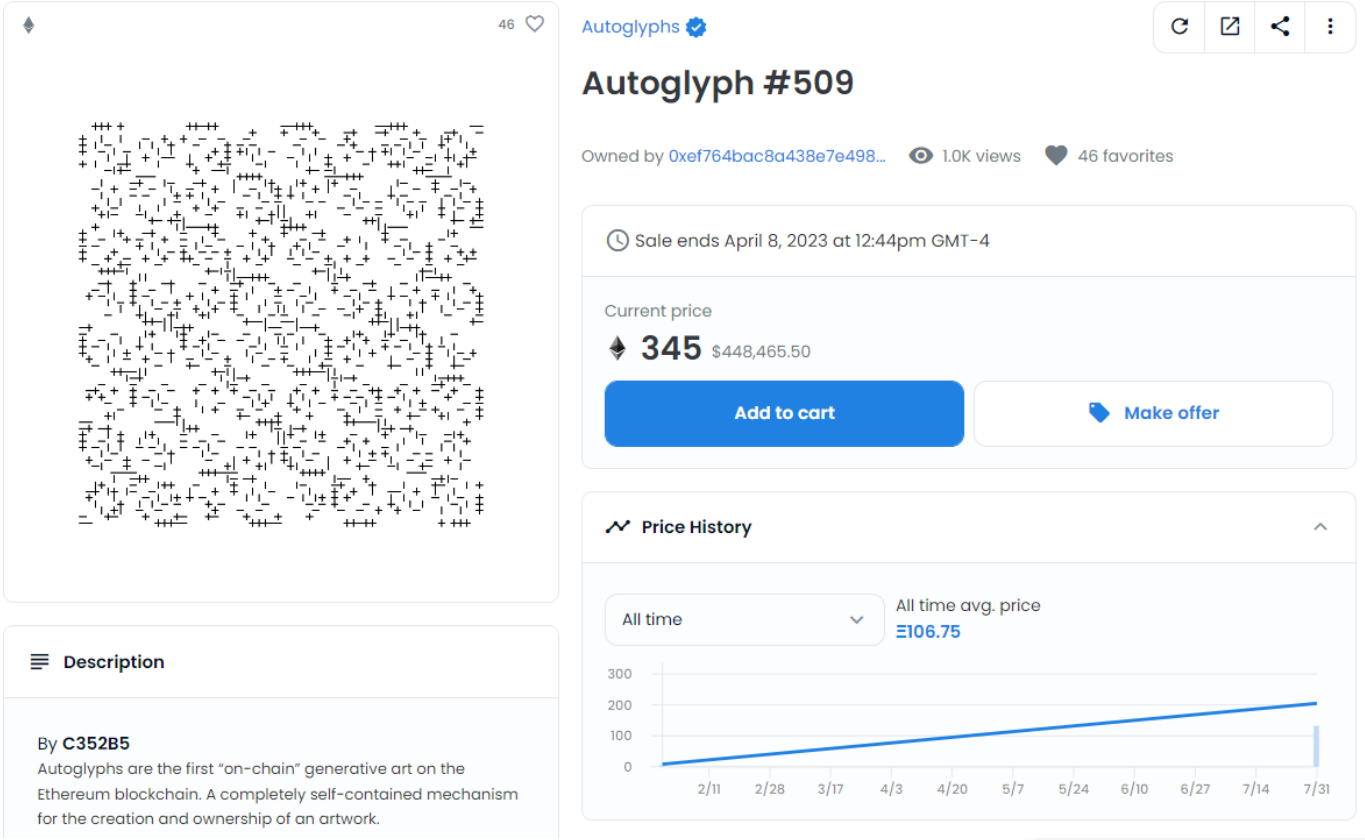






You can use the same technique on some NFT platforms like OpenSea

https://opensea.io/assets/ethereum/0xd4e4078ca3495de5b1d4db434bebc5a986197782/509



Useful Reference Materials

- European Cyber Crime Centre (EC3) (2022). Etheruem Guide - Follow the Ether, Europol.
- Ethereum Glossary: https://info.etherscan.com/glossary/
- Ethereum 2.0 Glossary: https://info.etherscan.com/eth2glossary/
- Etherscan FAQ: https://info.etherscan.com/tag/faq/
- Ethereum Documentation: https://ethereum.org/en/developers/docs/