

Closing Solana token accounts with an open source DApp to defend against scams

An experiment to find a user-friendly method to revert *delegation NFT*
scam attacks in Solana.

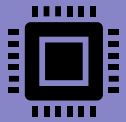
Motivation (I)

Many most up-to-date NFT scam in Solana don't just steal from users after tricking her to interact with a phishing DApp. Instead, they issue an *Approve* instruction to all of the user's ATAs, delegating them to an attacker's account. This effectively give the attacker the ability to keep stealing from the user as she receive more tokens or NFT in the future.

This is particularly egregious when the victim has some NFT or tokens stacked in some DApp that can only un-stake to the user account, from where they would immediately be retired by the attacker.

Furthermore, the subsequent transactions that the attacker performs stealing tokens or NFTs are not signed by the user and would not show on any Solana explorer in the user transaction history.

Motivation (II)



If a user find herself in such situation and she wants to use Phantom, she's out of luck, given that Phantom does not have a feature to remove account delegation (as of the day of writing).



We are assuming that the user does not posses the technical knowledge necessary to break the delegation via programming or CLI.

Motivation (and II)

I propose a user-friendly approach for the user to solve this problem: closing all her ATAs with a DApp called *Free Redeemer*, an open source DApp maintained by a popular Solana community member: **Andreas Schmidhofer**.

When the user unstack her funds, the ATA for this mint will be reopened but the delegation will be lost, allowing the user to keep her funds.

What follow is a small experiment, creating a situation similar to the one caused by this attack, and showing how the user can easily break the delegation.

Experiment outline

- ◆ Starting with a Phantom installation with an account with an ATA with no tokens.
- ◆ Export the account private key to the console environment.
- ◆ Delegate the ATA with CLI.
- ◆ Check the delegation on a Solana explorer.
- ◆ Close the ATA with a Dapp (proposed user intervention).
- ◆ Send a token of the same mint to reopen the ATA.
- ◆ Check that delegation is no longer on place.

Starting with a Phantom installation with an account with an ATA with no tokens.

SOLSCAN\$38.68 2.44% MC: \$13.36B #9

[Home](#) [Analytics](#) [Defi](#) [NFTs](#) [Tokens](#) [Blockchain](#) [Resources](#) [Sign in](#)

Token Account

39novfTs9kPsNzfyeB1rt9nR6uarhBRETaabqRuwHiZM

Overview

SOL Balance

0.00203928 SOL (\$0.07898131)

SPL Token Address

XzR7CUMqhDBzbAm4aUNvwhVCxjWgN1KEvqTp3Y8fFCD

SPL Token Name

Scammer Token Beware (SCAM)

Balance

0 SCAM

More info

Owner

9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBR5

Transactions

SPL Transfer

Signature	Block	Time	Instructions	By	Fee (SOL)
59Zp9MUFUgHADJlKZZmBwwv...	#141860074	9 days ago	Spl-Transfer	9Z7Pkm...8AEBR5	0.000005
4TCLS8DDJYWkQouz8BVwrmcn...	#141859753	9 days ago	CreateAssociatedAccount	EXbvhi...sgwUJE	0.000005

Solskan

Account detail | Solana Beach

https://solskan.io/account/9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBR5

\$38.75 -2.37%

MC: \$13.37B #9 [Home](#) [Analytics](#) [Defi](#) [NFTs](#) [Tokens](#) [Blockchain](#) [Resources](#) [Sign in](#)

Account

9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBR5

Overview

SOL Balance

0.000995 SOL (\$0.0384866)

Owner Program

System Program

Rent Epoch

330

Stake

0 SOL

More info

Transactions

SOL Transfers

SPL Transfers

Token Accounts

Stake Accounts

Domains

Account	SOL Balance	Token	Token Balance	Value
39novf...uwHiZM	0.002	Scammer Token Beware (SCAM)	0	

```
C:\Windows\System32\cmd.e  X  +  v

C:\Users\salsa>solana-keygen recover 'prompt:?key=0/0' --outfile C:\Users\salsa\.config\solana\id.json
[recover] seed phrase:
[recover] If this seed phrase has an associated passphrase, enter it now. Otherwise, press ENTER to continue:
Recovered pubkey `9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBR5`. Continue? (y/n): y
Wrote recovered keypair to C:\Users\salsa\.config\solana\id.json

C:\Users\salsa>solana balance
0.000995 SOL

C:\Users\salsa>
```

Export the account private key to the console environment (via seed in this case)

```
C:\Windows\System32\cmd.e X + v

c:\Users\salsa>spl-token approve
error: The following required arguments were not provided:
  <TOKEN_ACCOUNT_ADDRESS>
  <TOKEN_AMOUNT>
  <DELEGATE_TOKEN_ACCOUNT_ADDRESS>

USAGE:
  spl-token approve <TOKEN_ACCOUNT_ADDRESS> <TOKEN_AMOUNT> <DELEGATE_TOKEN_ACCOUNT_ADDRESS> --conf:

For more information try --help

c:\Users\salsa>spl-token approve 39novfTs9kPsNzfyeblrt9nR6uarhBRETaabqRuwHiZM 10 5kUNCUNXjKMcA7v3Lphc
doYTD
Approve 10 tokens
  Account: 39novfTs9kPsNzfyeblrt9nR6uarhBRETaabqRuwHiZM
  Delegate: 5kUNCUNXjKMcA7v3Lphq6frMUZgohjGeXtcVViHdoYTD

Signature: 5iZu48VMUQyc1CFSipuQQPaFG2kkfgYQ45DucVP39rfJWcMwXq77L4sXrSj4J8xqKBZTHy4bPg2L98nJL42sksdY

c:\Users\salsa>
```

Transaction Details

Search transactions, blocks, programs and tokens

Overview

SOL Balance Change

Token Balance Change

Signature	5iZu48VMUQyc1CFSipuQQPaFG2kkfgYQ45DucVP39rfJWcMwXq77L4sXrSj4J8xqKBZTHy4bPg2L98nJL42sksdY
Block	# 143111748
Timestamp	2 minutes ago July 25, 2022 16:03:52 PM +UTC
Result	Success Finalized (MAX confirmations)
Signer	9Z7Pkm5FgPGZVFQ3jtlCJoYbnign8NxZdqFU6s8AEBr5
Fee	0.000005 SOL
Previous Block Hash	GvS8D2fPWem4ZJmY1ipl7ypUn3MAEZNgjvT8jwV6XjpT
Your Notes	Add notes

Instruction Details




#1 - ApproveChecked

Interact With	Token Program - TokenkegQfeZyiNwAJbNbGKPFXCWuBvf9Ss623VQ5DA
Input Accounts	#1 - Delegate - 5kUNCUNXjKMcA7v3Lphq6frMUZgohjGeXtcVViHdoYTD
	#2 - Mint - XzR7CUMqhDBzbAm4aUNvwhVCxjWGN1KEvqTp3Y8fCD
	#3 - Owner - 9Z7Pkm5FgPGZVFQ3jtlCJoYbnign8NxZdqFU6s8AEBr5 Writable Signer Fee Payer
	#4 - Source - 39novfTs9kPsNzfyeblrt9nR6uarhBRETaabqRuwHiZM Writable
	#5 - TokenAmount - 10

Delegate the ATA with CLI

Solscan x Solscan x Account detail | Solana Beach x +

https://solanabeach.io/address/39novfTs9kPsNzfyeB1rt9nR6uarhBRETaabqRu...

Support us in exploring the future of Solana Beach. Sign up to get in touch.

[Sign up here](#)

Token Info

Balance	0	Token	XzR7...fCD
Delegated Amount	10,000	Initialized	No
Owner Account	9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBr5		

Account Authorities

Delegate Authority Address	5KUNcUNXjKMCA7v3Lphq6frMUZgohjGeXtcVViHdoYTD
Close Authority Address	System Program

Transactions ▼

TRANSACTION HASH	INSTRUCTIONS	STATUS	FEE	TIMESTAMP
5iZu...ksdY	ApproveChecked	Success	0.000005 SOL	7 minutes ago

Check the
delegation on a
Solana explorer
(solanabeach.io)

Close the ATA with a Dapp (user intervention)

- ◇ DApp: <https://loopcreativeandy.github.io/fee-redeemer/>
- ◇ Github repo: <https://github.com/loopcreativeandy/fee-redeemer>

The screenshot shows the Solana Fee Redeemer DApp interface. The main screen displays the app's name, a 'CONNECT WALLET' button, and a description. A modal titled 'Approve Transaction' is open, showing the transaction details and a 'REDEEM' button. The transaction details include the estimated balance changes and the network fee. The 'Scam NFT' details are also visible, showing the NFT's name, owner, and program ID.

Solana Fee Redeemer

Empty Accounts: 1
You can redeem: 0.002 SOL in 1 transaction
Total Redemmed: 344.559 SOL

Donate: 10%

REDEEM

developed and maintained by solandy.sol
follow me on [Twitter](#) and [YouTube](#)

Approve Transaction
loopcreativeandy.github.io

Estimated Balance Changes

SOL	+0.00184 SOL
Network Fee	< 0.00001 SOL

Hide advanced transaction details

Close account

Source	39nov...wHiZM
Destination	9Z7Pk...AEBr5
Owner	9Z7Pk...AEBr5

Transfer SOL

To	AdonB...qWyD4
Amount	0.0002 SOL

Unknown

Program Id	FrctR...ebjC2
Data	coCLqWcz4RT

Cancel Approve

Scam NFT (9Z7P...EBR5)

id	address	lamports	mint
0	39novTs9kPsNzfyeb1rt9nR6uarhBRETaabqRuwHiZM	2039280	XzR7CUMqhDBzbAm

1 row selected

Token account is now closed

Solscan

Account detail | Solana Beach

https://solscan.io/tx/2ucGXLhNSXY9xeSdn841qh6hRkxJsnuVZozdhVHpxxRfkDuJyM3po7UFWkxwvDidxrLbuXSswtDzUzn4ppDctP

Fee

0.000005 SOL

Main Actions

SOL transfer

Transfer from 9Z7Pkm...8AEBr5 to AdonBe...YqWyD4 for 0.00020392 SOL

Previous Block Hash

6vn4YntEBg7xEb1335mj3GFvVffKNmyLY1rBbDuYKMc

Your Notes

Add notes

Instruction Details

#1 - Close Account

Interact With

Token Program - TokenkegQfeZyLJwAjbNbGKPFXCWuBvF9Ss623VQ5DA

Input Accounts

#1 - ClosedAccount - 39novTs9kPsNzfyeb1rt9nR6uarhBRETaabqRuwhIZM

#2 - Destination - 9Z7Pkm5FgPGZVFQ3jLtLcJoYbnign8NxZdqFU6s8AEBr5

#3 - Owner - 9Z7Pkm5FgPGZVFQ3jLtLcJoYbnign8NxZdqFU6s8AEBr5

#2 - SOL Transfer

Interact With

System Program - 11111111111111111111111111111111

Instruction Data

02000000981c030000000000

Input Accounts

#1 - Source - 9Z7Pkm5FgPGZVFQ3jLtLcJoYbnign8NxZdqFU6s8AEBr5

#2 - Destination - AdonBeatQ76Vwq7VrTK2rA4DnB4NyLSHsjE5usYqWyD4

#3 - Amount - 0.00020392 SOL

#3 - Instruction 2

Interact With

Unknown - FrcTs3dZ7E234V5DMJLMUvnPkJANWQoaZDRm9rebjC2

Instruction Data

d6035d39d2c0b5ce

Input Accounts

#1 - Account0 - CntZ1JuK1kT2VA5QPkQiwU6aYiaPthP9okeRQ76YTCb

#2 - Account1 - Sysvar: Instructions

Account

9Z7Pkm5FgPGZVFQ3jLtLcJoYbnign8NxZdqFU6s8AEBr5

Overview

SOL Balance 0.00282035 SOL (\$0.10832972)

More info

Owner Program System Program
Rent Epoch 331
Stake 0 SOL

Transactions SOL Transfers SPL Transfers Token Accounts Stake Accounts Domains

Account	SOL Balance	Token	Token Balance	Value
No Data				

Solscan

Account detail | Solana Beach

https://solscan.io/account/39novTs9kPsNzfyeb1rt9nR6uarhBRETaabqRuwhIZM

SOLSCAN

\$38.48 2.31% MC: \$13.37B #9

Home Analytics Defi NFTs Tokens Blockchain Resources Sign in

Account

39novTs9kPsNzfyeb1rt9nR6uarhBRETaabqRuwhIZM

Overview

SOL Balance

0 SOL

More info

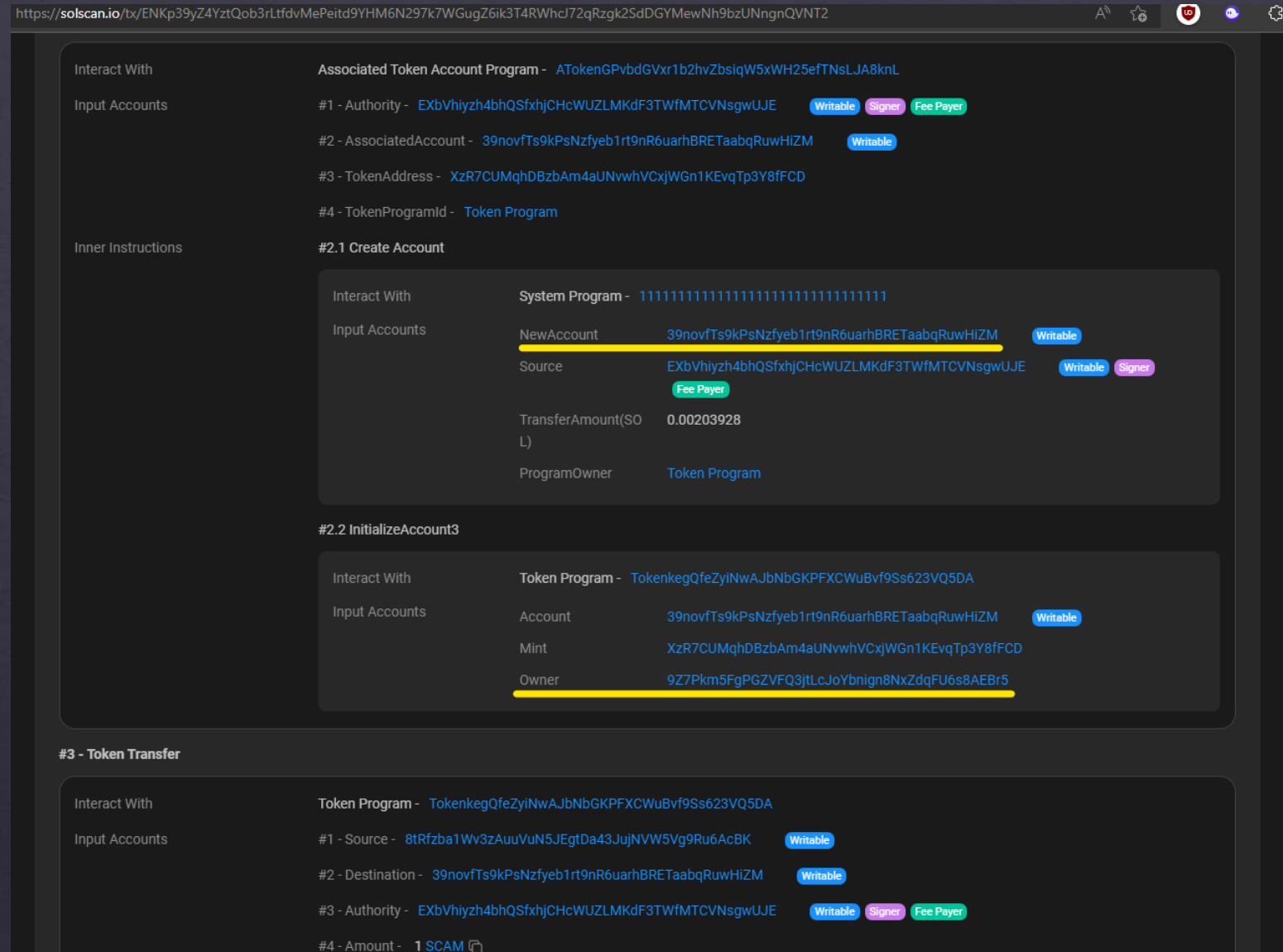
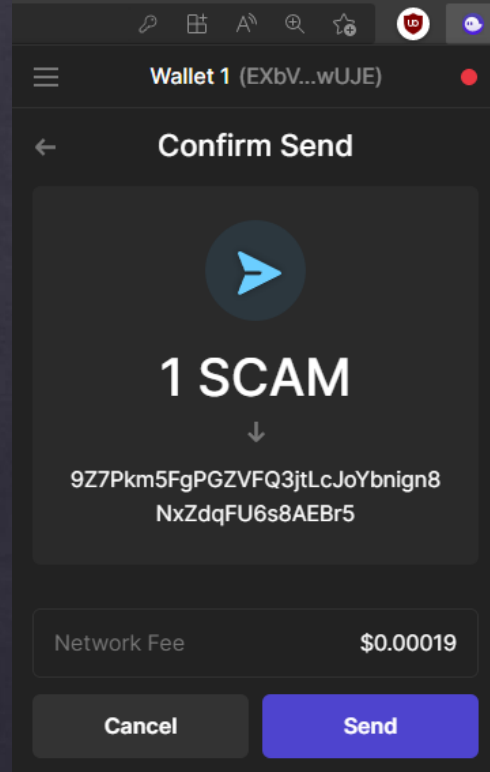
Stake

0 SOL

Transactions SOL Transfers SPL Transfers Token Accounts Stake Accounts Domains

Signature	Block	Time	Instructions	By	Fee (SOL)
2ucGXLhNSXY9xeSdn841qh6hR...	#143113316	2 minutes ago	CloseAccount (2+)	9Z7Pkm...8AEBr5	0.000005
5iZu48VMUQyc1CFSipuQQPaFG...	#143111748	18 minutes ago	Unknown	9Z7Pkm...8AEBr5	0.000005
59Zp9MUFUgHADJLkZZmBwwv...	#141860074	9 days ago	Spl-Transfer	9Z7Pkm...8AEBr5	0.000005
4TCLS8DDJYWkQouz8BVrmcn...	#141859753	9 days ago	CreateAssociatedAccount (2+)	EXbVhi...sgwUJE	0.000005

Send a token of the same mint to reopen the ATA



ATA is reopened, same address, no delegation

SOLSCAN

\$38.39 -2.36%

MC: \$13.3B

#9

HomeAnalyticsDefiNFTsTokensBlockchainResourcesSign in

Account

9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBR5

Search transactions, blocks, programs and tokens

Overview

SOL Balance

0.00282035 SOL (\$0.10827331)

SPL Token Balance

1 SPL token (\$0.00)

SCAM

1

More info

Owner Program

System Program

Rent Epoch

331

Stake

0 SOL

Transactions

SOL Transfers

SPL Transfers

Token Accounts

Stake Accounts

Domains

Account	SOL Balance	Token	Token Balance	Value
39novf...uWHIZM	0.002	Scammer Token Beware (SCAM)	1	

Solana Beach

Mainnet Beta

DashboardValidatorsTransactionsBlocksTokensSupply

We would like to hear your Feedback!

Support us in exploring the future of Solana Beach. Sign up to get in touch.

Sign up here

Token Info

Balance

1,000

Token

XzR7...fFCD

Delegated Amount

0

Initialized

No

Owner Account

9Z7Pkm5FgPGZVFQ3jtLcJoYbnign8NxZdqFU6s8AEBR5

Account Authorities

Delegate Authority Address

System Program

Close Authority Address

System Program

Conclusion

- ◆ Using the Open Source, well regarded DApp *Free Redeemer* to close her Token accounts is an easy and user-friendly way for a victim of a delegation attack to recover control over her ATAs.