Vesting smart contract

What is going on

Gaimin is going to have a private GMRX token sales round. It will happen near the date of the public sale (most probably a little bit earlier). During that private round, investors will get some amount of GMRX tokens. To prevent them from selling all the tokens once public sales begin Gaimin needs to have some vesting period for investors. That means that investors will own GMRX tokens but will be able to sell them only after a specific date, and there will be more than one unlock date, so investors will get access to their tokens in batches.

An example:
Gaimin will have a public sale on the 1st of November.
On the 20th of October Gaimin makes private sales for investors, with a 1-month cliff and 4 vesting periods of 3 months each.
Alise gets 100000 GMRX tokens on her locked wallet during private sales.
So she will be able to withdraw 25000 GMRX on the 1sh of December.
25000 GMRX on the 1st of March 2022
25000 GMRX on the 1st of June 2022
25000 GMRX on the 1st of September 2022

Gaimin is going to have multiple investors groups with different cliff and vesting periods.

Basic contracts overview

We already have GMRX tokens smart contract deployed.
On the mainnet GMRXs are bridged from Ethereum: https://polygonscan.com/address/0x73f56124a34e0214067b7e5f42a132b3ea072014
On testnet it is a standard ERC20 smart contract: https://mumbai.polygonscan.com/token/0x9037dd49bed73b3b2a99fce722d2f9207027bc3e

There will be 2 smart contracts: Time Locked Wallet (TLW) that will hold GMRXes for one user, and Factory that will create new TLWs for every user. The Factory will create TLWs as minimal clones, so the original TLW should already be deployed before the Factory would be used.
Original mainnet TLW: --missing--
Original testnet TLW: https://mumbai.polygonscan.com/address/0x1336DB2b9A517bB58ba0Fb41E82F105A3Dfd8DA6

TLW API:

Read functions:

_lockBoxes(int) - accept index of locking period starting from 0, return information about this locking period.

> Response example:
> *amount uint256* **:** 1000
> *unlockTime uint256* **:** 1650000000
> *paid bool* **:** false

_owner() - return address of beneficiary who will get the locked tokens.

_tokenAddress() - address of locked tokens contract (should be the address of GMRXes).

lockedAmount() - return total locked tokens left on this wallet.

readyToWithdraw() - return amount of tokens that are ready to be withdrawn.

Write functions:

initialize(…) - could be called only once, and will be called by the Factory automatically.

> input parameters:
> *owner* - beneficiary for whom tokens will be locked
> *tokenAddress*
> *amount*
> *numberOfPeriods* - number of the locked periods (number of withdrawals)
> *firstUnlockTime* - in second
> *periodDuration* - locked period duration
>
> validations:
> *owner* should be an address and not a smart contract
> *numberOfPeriods* > 0
> *firstUnlockTime* should be in the future
> check that this TLW already have tokens on the balance

withdraw() - transfer to the *owner* tokens from one unlocked period, revert otherwise.

Factory mainnet: --missing--
Factory testnet: - https://mumbai.polygonscan.com/address/0x3949fdea81eef50a4a0f4127f79a86b14037dccb

Factory API:
constructor(tokenAddress, tlwAddress)

Read functions:

_tlwAddress - return address of original TLW to make clones from.

_tokenAddress() - address of locked tokens contract (should be the address of GMRXes).

getWallets(address) - accept user address and return list of TLWs created to and created by this user.

owner - address of the Factory owner

Write functions:

newTimeLockedWallet(…)

> input parameters:
> *owner* - beneficiary for whom tokens will be locked
> *amount*
> *numberOfPeriods* - number of the locked periods (number of withdrawals)
> *firstUnlockTime* - in second
> *periodDuration* - locked period duration
>
> validations:
> *owner* should be an address and not a smart contract
> *amount* > 0
> *numberOfPeriods* > 0
> *firstUnlockTime* should be in the future
> *periodDuration* >= 1 minute
> check that token allowance is correct

clone original TLW to the new address, transfer tokens to new TLW and return address.

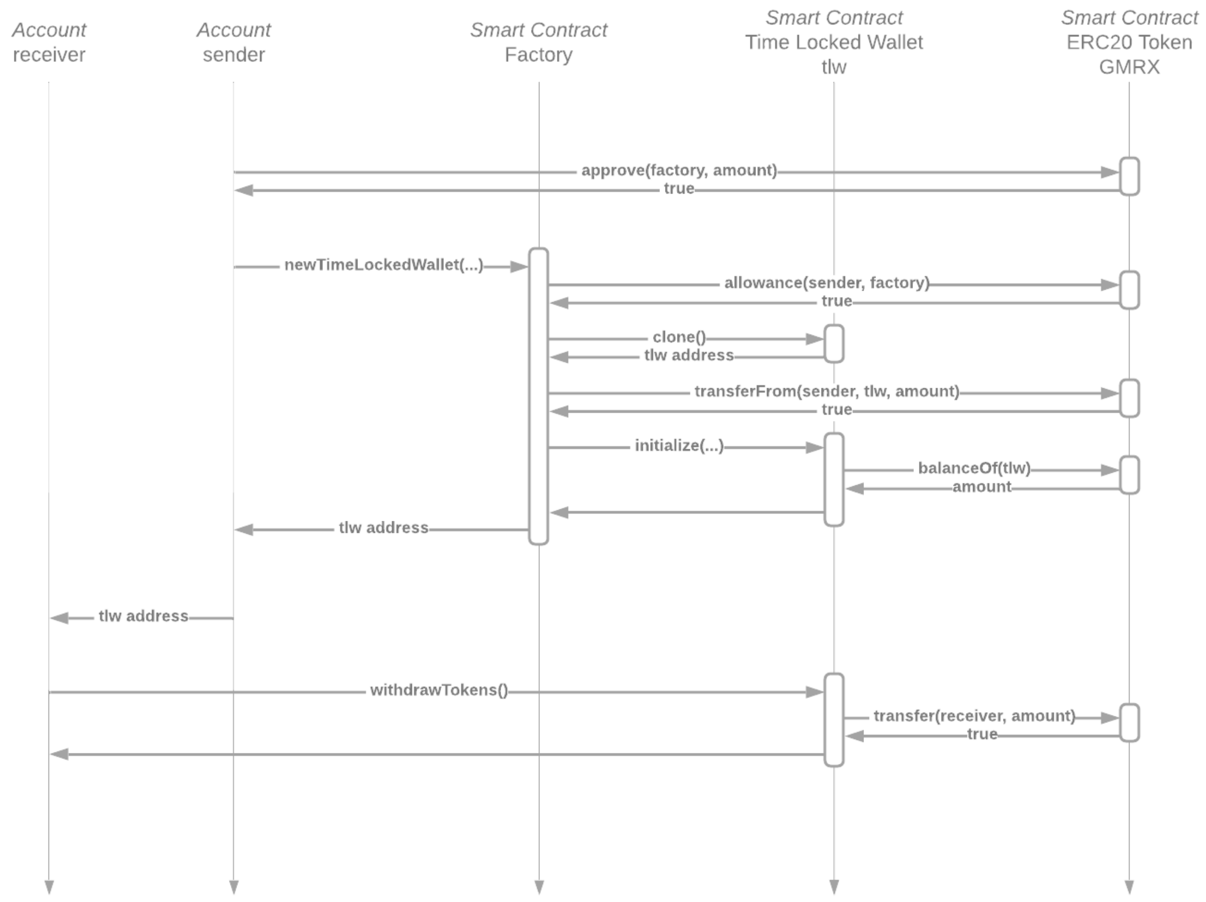
renounceOwnership() - remove owner from contract, so contract will stay immutable after that

setTokenAddress(address)

setTLWAddress(address)

transferOwnership(address) - transfer ownership to new address

Factory flow



Example

Let's assume that Alice wants to lock 1000 GMRXes for Bob. Tokens should be locked in 4 equal periods, Bob should be able to get his money starting from 09.10.2021 and then each day gets another 25% of the locked amount.

Alice address: 0xBD8911B2967efE7C98A731f5332A76526902AEe4

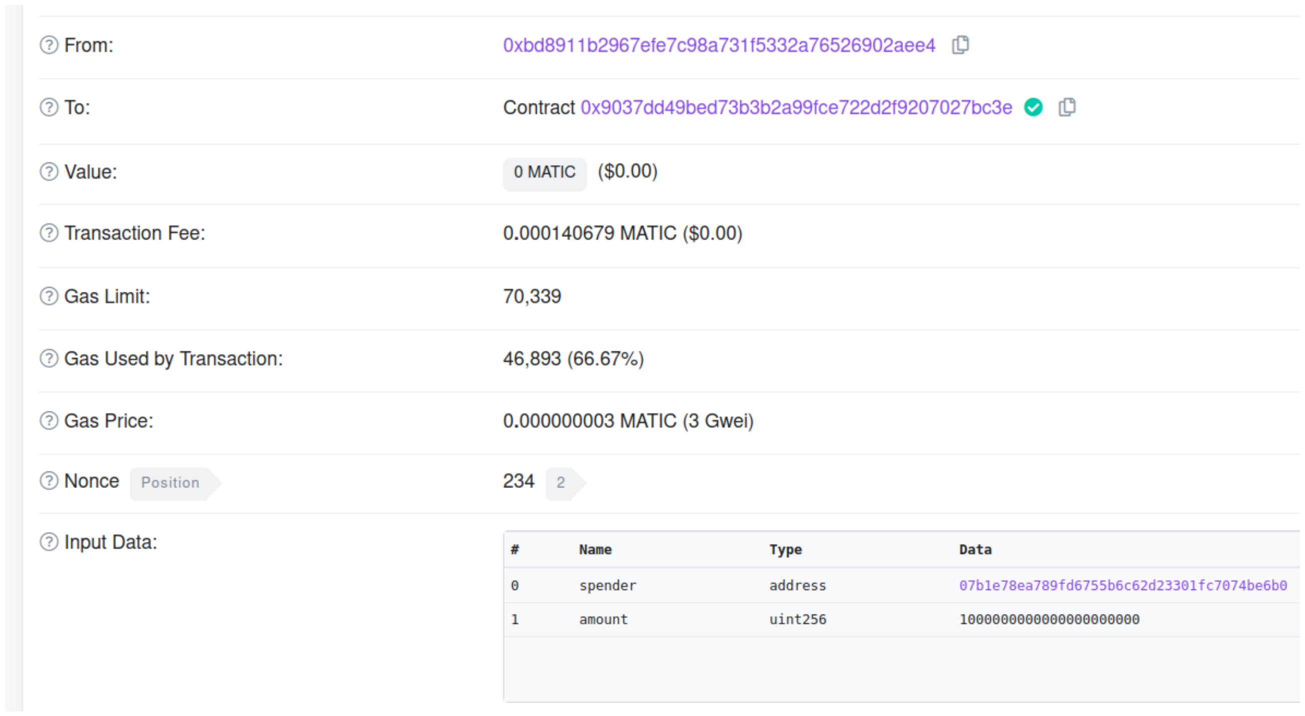
Bob address: 0xF1746359eFeaA3468e4C521187c57D3ee189F561

GMRX: 0x9037dD49BeD73b3b2a99fCE722d2F9207027Bc3e

Original TLW: 0x06E5D057280B9Cba511809c393c8c66C64ad675b

Factory: 0x07b1e78Ea789FD6755b6C62D23301FC7074be6b0

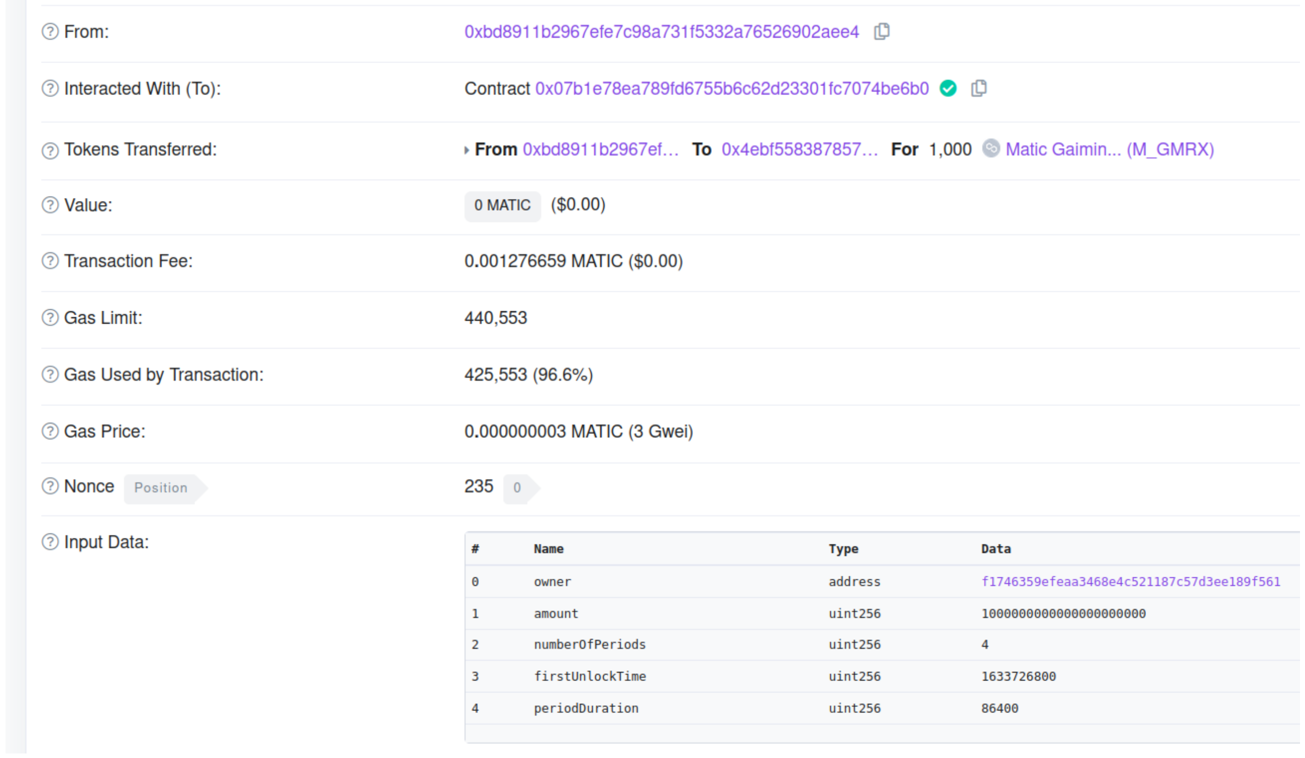
1. Alice approve that Factory could spend 1000 GMRXes
   Alice makes
   approve(0x07b1e78Ea789FD6755b6C62D23301FC7074be6b0, 1000000000000000000000)
   call to 0x9037dD49BeD73b3b2a99fCE722d2F9207027Bc3e.
   1000000000000000000000 - is 1000 GMRX including 10^18 decimals
   https://mumbai.polygonscan.com/tx/0x183cd9380f54a46f858a0dead8e33589ed2662ef184d23208d63e9947e06048a



From:	0xbd8911b2967efe7c98a731f5332a76526902aee4
To:	Contract 0x9037dd49bed73b3b2a99fce722d2f9207027bc3e
Value:	0 MATIC ($0.00)
Transaction Fee:	0.000140679 MATIC ($0.00)
Gas Limit:	70,339
Gas Used by Transaction:	46,893 (66.67%)
Gas Price:	0.000000003 MATIC (3 Gwei)
Nonce Position	234 2
Input Data:	

#	Name	Type	Data
0	spender	address	07b1e78ea789fd6755b6c62d23301fc7074be6b0
1	amount	uint256	1000000000000000000000

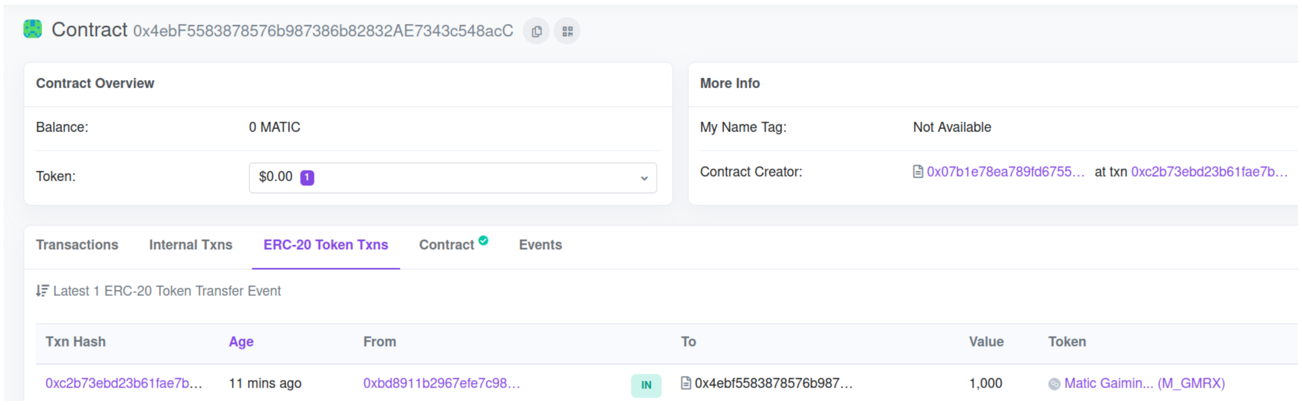
2. Alice creates a new TLW through Factory
   Alice makes
   newTimeLockedWallet(0xF1746359eFeaA3468e4C521187c57D3ee189F561, 1000000000000000000000, 4, 1633726800, 86400)
   call to 0x07b1e78Ea789FD6755b6C62D23301FC7074be6b0
   1000000000000000000000 - is 1000 GMRX including 10^18 decimals
   1633726800 - is timestamp of 09.10.2021
   86400 - one day in seconds
   https://mumbai.polygonscan.com/tx/0xc2b73ebd23b61fae7bd203747ea7c505e339b031edc6f7330c03ab4f22b5b831



From:	0xbd8911b2967efe7c98a731f5332a76526902aee4
Interacted With (To):	Contract 0x07b1e78ea789fd6755b6c62d23301fc7074be6b0
Tokens Transferred:	From 0xbd8911b2967ef... To 0x4ebf558387857... For 1,000 Matic Gaimin... (M_GMRX)
Value:	0 MATIC ($0.00)
Transaction Fee:	0.001276659 MATIC ($0.00)
Gas Limit:	440,553
Gas Used by Transaction:	425,553 (96.6%)
Gas Price:	0.000000003 MATIC (3 Gwei)
Nonce Position	235 0
Input Data:	

#	Name	Type	Data
0	owner	address	f1746359efeaa3468e4c521187c57d3ee189f561
1	amount	uint256	1000000000000000000000
2	numberOfPeriods	uint256	4
3	firstUnlockTime	uint256	1633726800
4	periodDuration	uint256	86400

With this transaction new TLW was created 0x4ebf5583878576b987386b82832ae7343c548acc
Now it holds all 1000 GMRXes


Contract 0x4ebF5583878576b987386b82832AE7343c548acC

Contract Overview	
Balance:	0 MATIC
Token:	$0.00 1

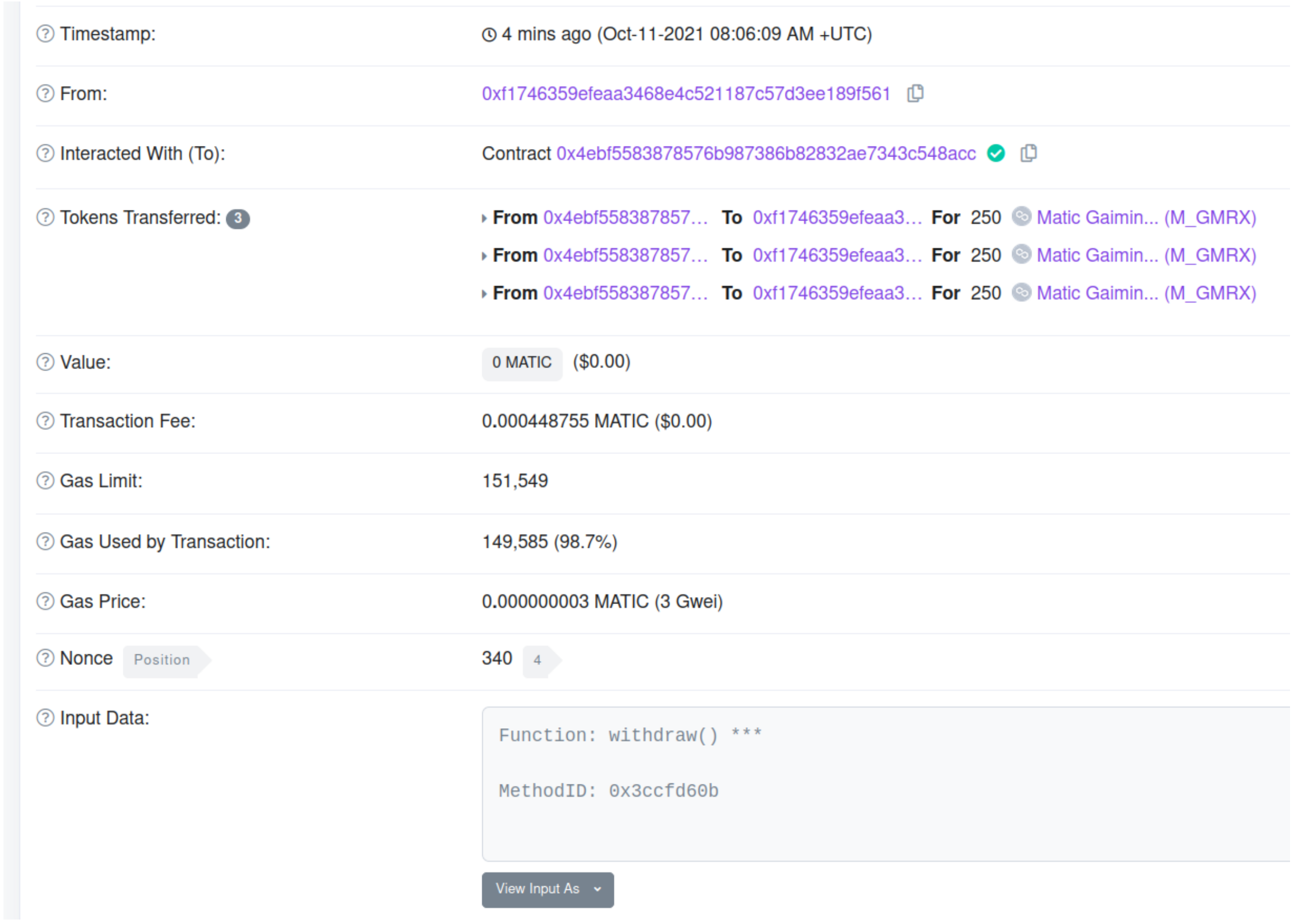
More Info	
My Name Tag:	Not Available
Contract Creator:	0x07b1e78ea789fd6755… at txn 0xc2b73ebd23b61fae7b…

Transactions | Internal Txns | ERC-20 Token Txns | Contract | Events

Latest 1 ERC-20 Token Transfer Event

Txn Hash	Age	From		To	Value	Token
0xc2b73ebd23b61fae7b…	11 mins ago	0xbd8911b2967efe7c98…	IN	0x4ebf5583878576b987…	1,000	Matic Gaimin... (M_GMRX)

3. Bob now can try to withdraw the tokens
   Bob makes
   withdraw()
   call to 0x4ebf5583878576b987386b82832ae7343c548acc
   But gets an error: ‘Nothing to withdraw’ and the transaction is reverted.
4. Bob waits for 11.10.2021 and tries to withdraw again, now 3 days passed, so Bod should be able to get 750 GMRXes
   Bob makes
   withdraw()
   call to 0x4ebf5583878576b987386b82832ae7343c548acc
   https://mumbai.polygonscan.com/tx/0x45700d96450ba8ec13dbe1297f934cde6ec16eb7afc9e2497ad4415c5d55fdde



Timestamp:	4 mins ago (Oct-11-2021 08:06:09 AM +UTC)
From:	0xf1746359efeaa3468e4c521187c57d3ee189f561
Interacted With (To):	Contract 0x4ebf5583878576b987386b82832ae7343c548acc
Tokens Transferred: 3	From 0x4ebf558387857… To 0xf1746359efeaa3… For 250 Matic Gaimin... (M_GMRX)
	From 0x4ebf558387857… To 0xf1746359efeaa3… For 250 Matic Gaimin... (M_GMRX)
	From 0x4ebf558387857… To 0xf1746359efeaa3… For 250 Matic Gaimin... (M_GMRX)
Value:	0 MATIC ($0.00)
Transaction Fee:	0.000448755 MATIC ($0.00)
Gas Limit:	151,549
Gas Used by Transaction:	149,585 (98.7%)
Gas Price:	0.000000003 MATIC (3 Gwei)
Nonce Position	340 4
Input Data:	Function: withdraw() *** MethodID: 0x3ccfd60b

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Function: withdraw() ***

MethodID: 0x3ccfd60b
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Links:

1. Github repository https://github.com/Gaimin-io-Limited/gmrx-vesting
2. ERC20 token https://docs.openzeppelin.com/contracts/4.x/erc20
3. Minimal Clone https://docs.openzeppelin.com/contracts/4.x/api/proxy#minimal_clones

4. Ownable extension https://docs.openzeppelin.com/contracts/4.x/api/access#Ownable
5. Initializable extension https://docs.openzeppelin.com/contracts/4.x/api/proxy#Initializable