

The background of the slide features a complex, abstract network diagram. It consists of numerous nodes, represented by small circles in various colors including teal, orange, yellow, purple, and black. These nodes are interconnected by a dense web of thin, dark grey lines, creating a sense of a global or decentralized network. The overall aesthetic is modern and technological, with a light grey gradient background.

# ETHEREUM



Blockchain, DApp, DAO

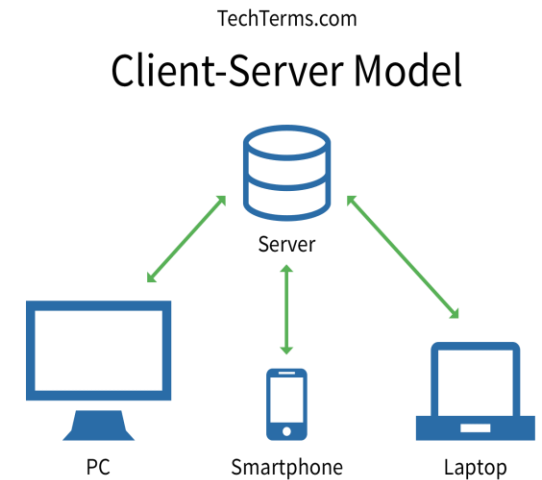
# Ethereum Network

Ethereum is a network of computers these networks are used to transfer money and store data. We can form a network using one or more nodes.

What is a node?

It is a machine (any type of computer) running in Ethereum client. All the computers are connected to form the actual network.

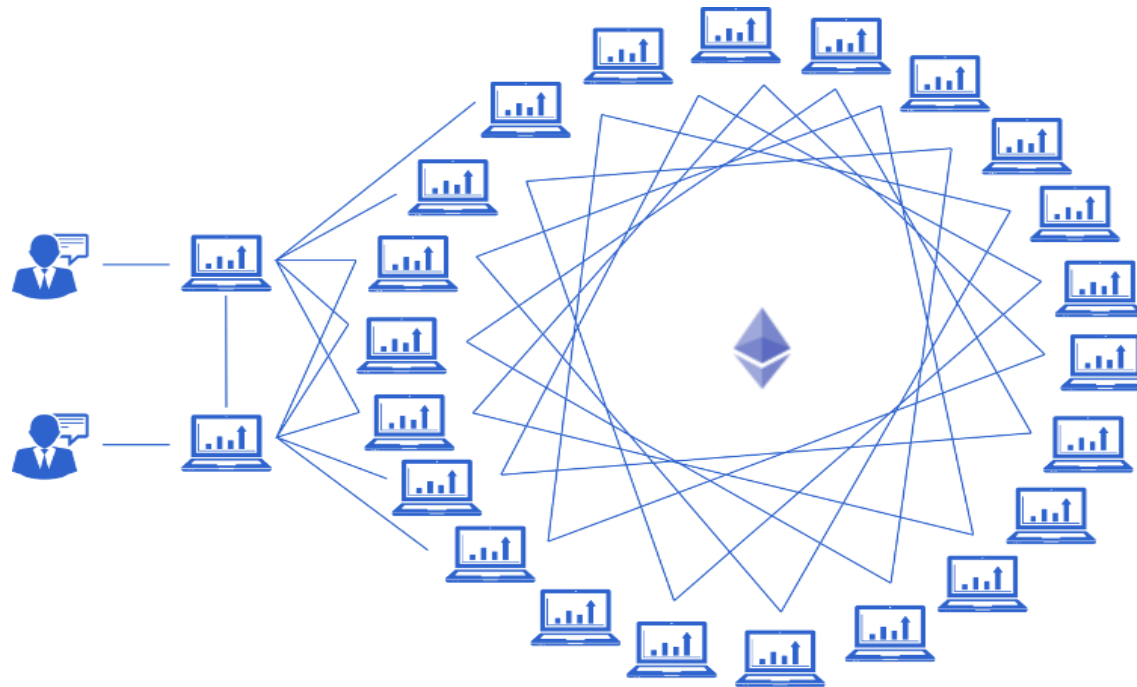
★ anyone can run a node all what you need is to download the client software application. Where each node has a separate copy of the blockchain.



There is two group of technology that can connect to the network:

**Developers:** technology used to create the actual network through code. Like using web3.js library.

**Consumers:** Metamask browser extension allow people to interact with Ethereum network.



[economicpoint.com](http://economicpoint.com)



METAMASK

Rinkeby Test Network



Account 1

0x29d...1752



0.3 ETH



Buy



Send



Swap

Assets



0.3 ETH

Don't see your token?

[Import tokens](#)

## Networks

[Show/hide](#) test networks

Dismiss

- Ethereum Mainnet
- Ropsten Test Network
- Kovan Test Network
- Rinkeby Test Network
- Goerli Test Network
- Localhost 8545

[Add Network](#)

# What means to have MetaMask Account?

When MetaMask create an account for us, it created an account that has three distinct pieces of information.



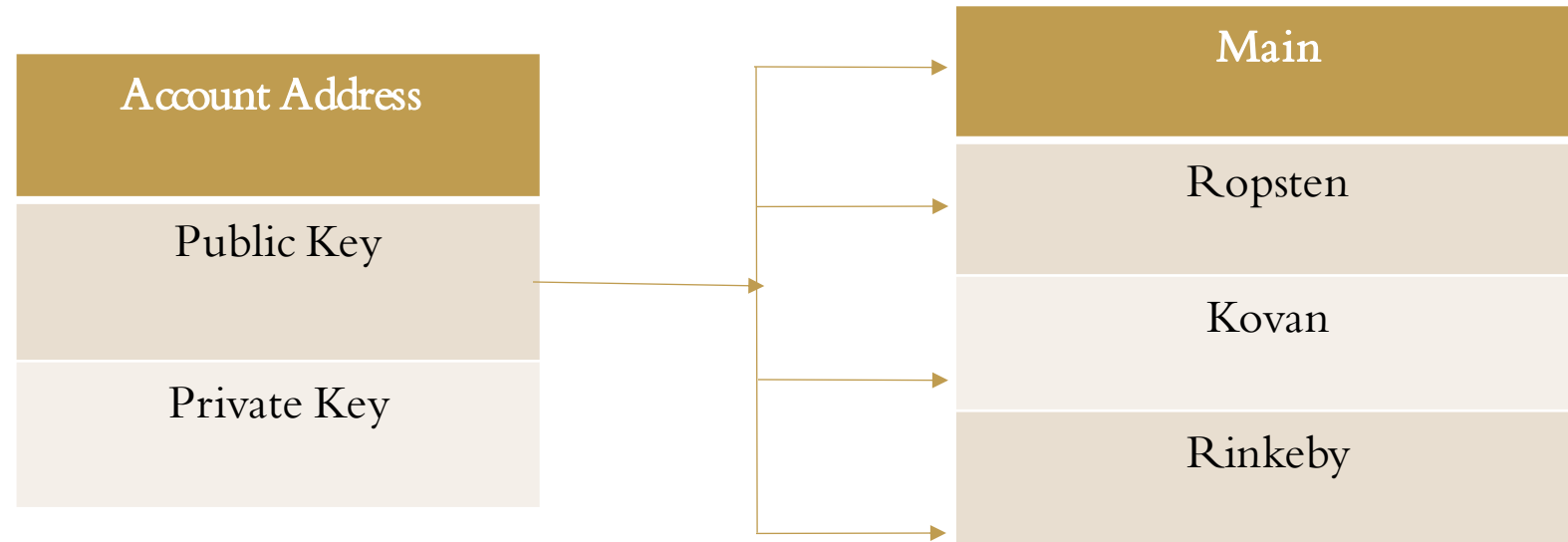
## Account Address:

It can be thought about like an email address or username. It is a unique identifier can be shared with anyone in the world, and it tells other people who you are. **Identify the account.**

## Public key and Private key:

These two pieces of information combined to essentially form a password of sorts. They are used to authorize the sending of funds from your account to another. Therefore, if the private key is unknown no one have the true access to the funds that are assigned to that account.

Account Address, Private Key and Public Key are stored as a hexadecimal.



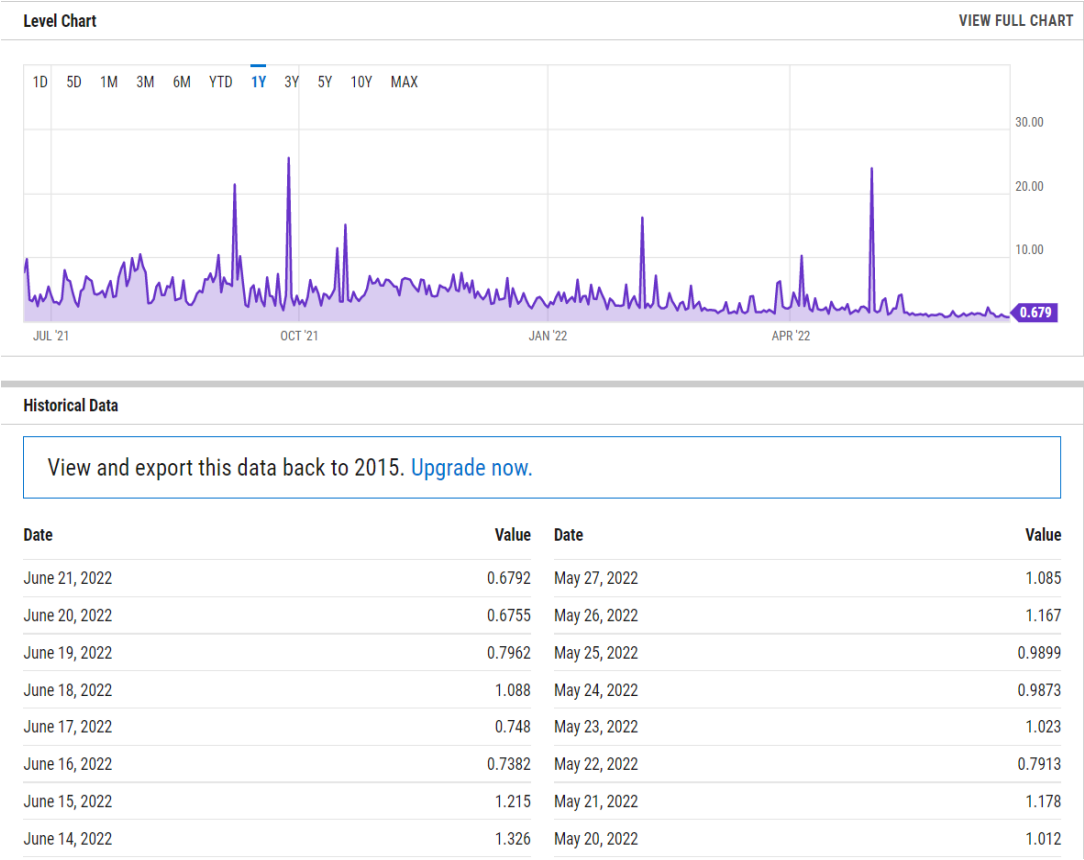
The account that we created is used across all different networks.

# Transaction

It is a record describes one account attempting to send money to anther account. It created anytime two accounts exchanged some amount of money.

Whenever we make a transaction, we create an object and then submitted to Ethereum network to process it.

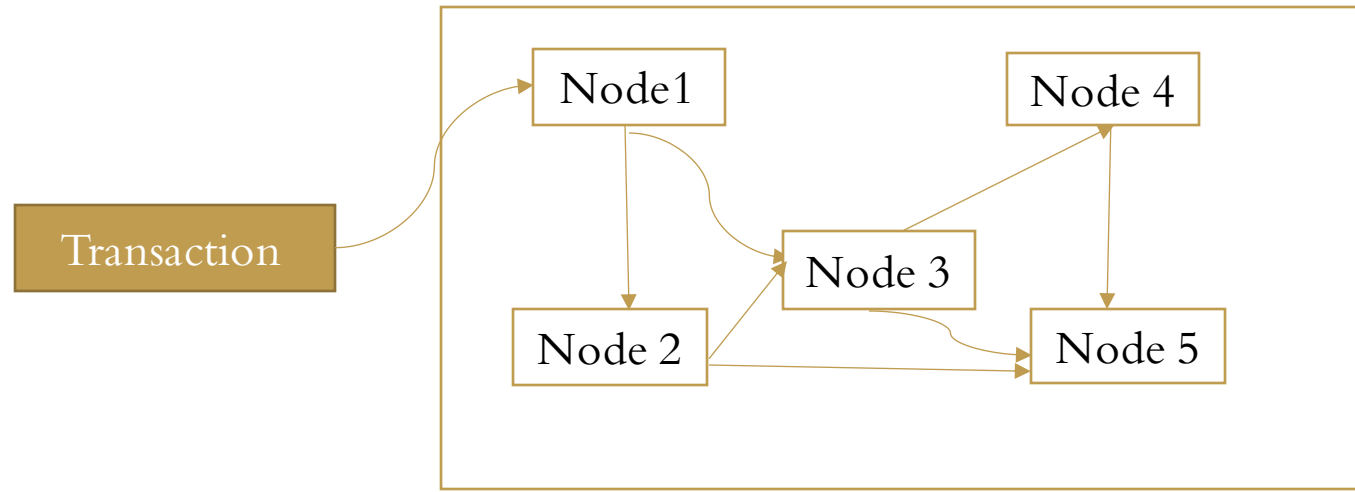
This object has a variety of different properties assigned to it.





Nonce	How many times the sender has sent a transaction
To	Address of account this money is going to
Value	The amount of ether to send to the target address
gasPrice	Amount of ether the sender is willing to pay per unit gas to get this transaction processed
startGas/gasLimit	Unit of gas that this transaction can consume
V	Cryptographic pieces of data that can be used to generate the senders account address. Generated from the sender's private key.
R	Cryptographic pieces of data that can be used to generate the senders account address. Generated from the sender's private key.
S	Cryptographic pieces of data that can be used to generate the senders account address. Generated from the sender's private key.

# Mining basics



When we sent the transaction out, it went to one very particular node. The application interfacing with one node and that node will be communicating with the rest of the network later until each node receives the transaction. Each node will gather the transactions to create the block. For each node to validate the transaction it needs to solve a puzzle by using high computing power. After validating the transaction which means the data in the transaction and the fees is enough to pursue with the transaction.

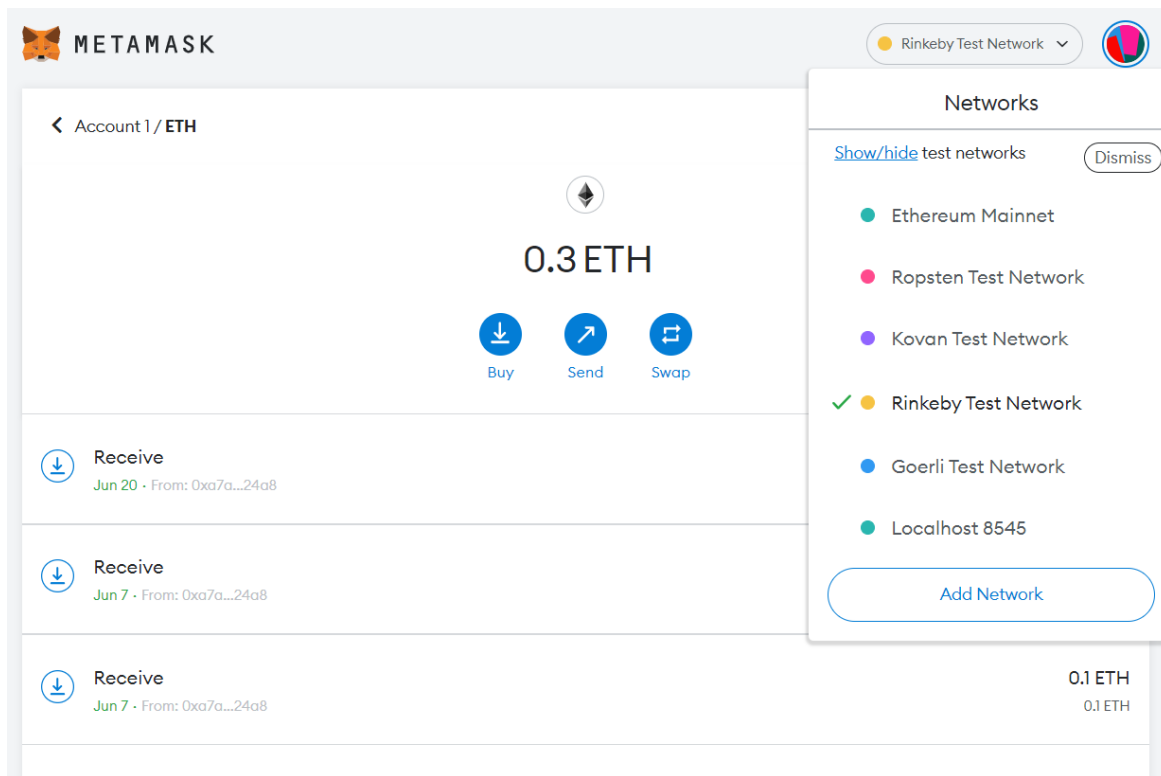
# Blockchain

After validating the transaction, the node will add the block to the blockchain. It will also send it out to all connected nodes to the network. The network nodes will validate the new block for ex if the solution is correct. The faster node to solve the puzzle they will be rewarded by ether and these nodes called miners. blocks themselves are bounded in size. Each block has a target size of 15 million gas but the size of blocks will increase or decrease in accordance with network demands, up until the block limit of 30 million gas (2x target block size). The total amount of gas expended by all transactions in the block must be less than the block gas limit. This is important because it ensures that blocks can't be arbitrarily large. If blocks could be arbitrarily large, then less performant full nodes would gradually stop being able to keep up with the network due to space and speed requirements



# Block Structure

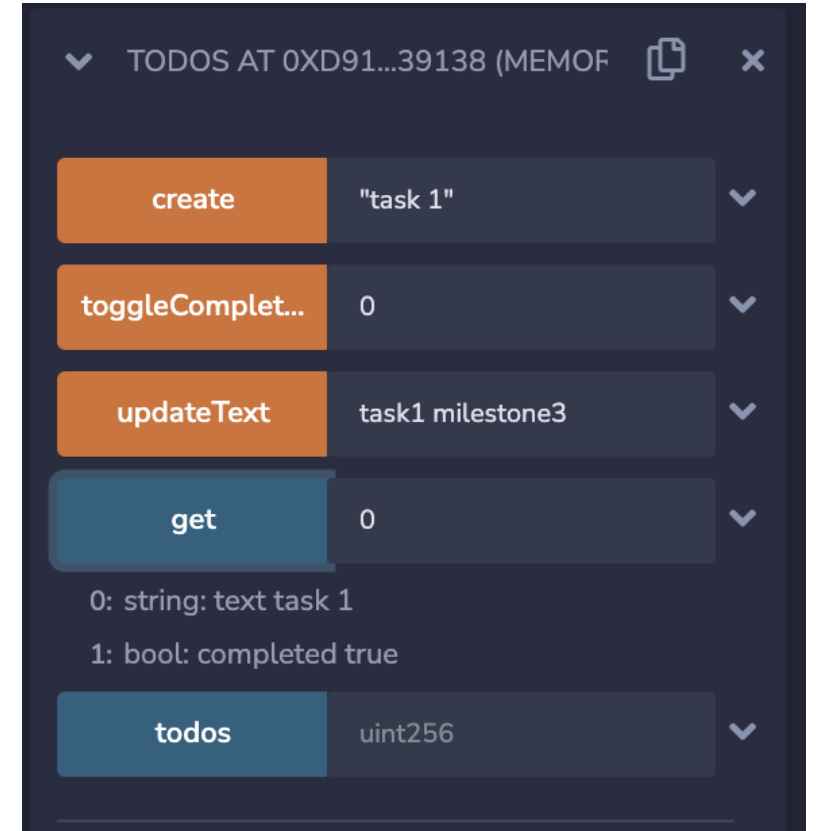
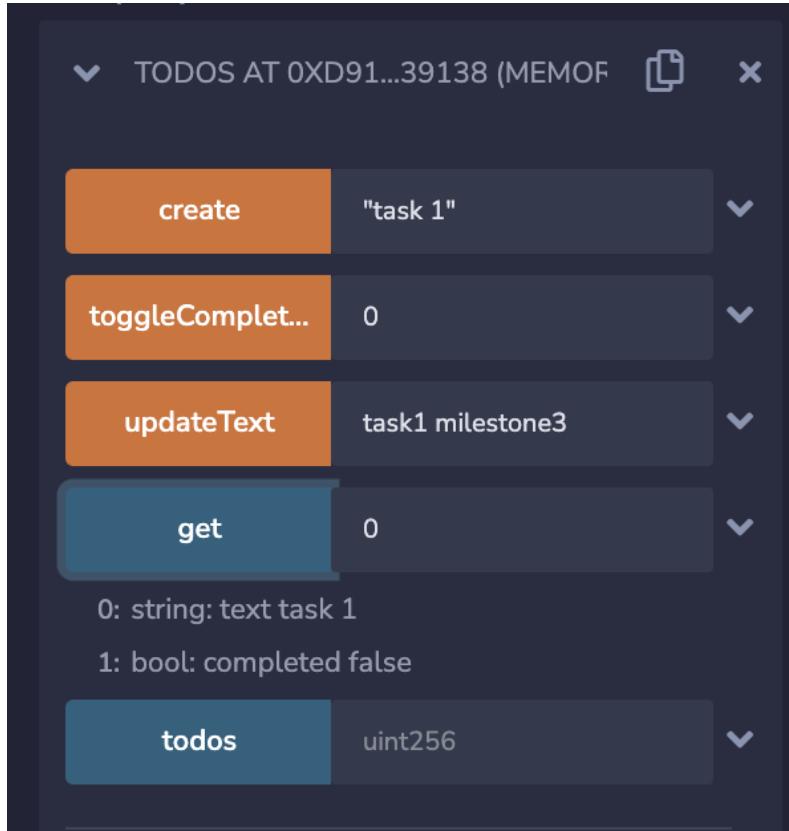
timestamp	the time when the block was mined
blockNumber	the length of the blockchain in blocks
baseFeePerGas	the minimum fee per gas required for a transaction to be included in the block
difficulty	the effort required to mine the block.
mixHash	a unique identifier for that block
parentHash	the unique identifier for the block that came before (this is how blocks are linked in a chain).
transactions	the transactions included in the block
stateRoot	the entire state of the system: account balances, contract storage, contract code and account nonces are inside.
nonce	a hash that, when combined with the mixHash, proves that the block has gone through <a href="#">proof-of-work</a> .



# Milestone 3

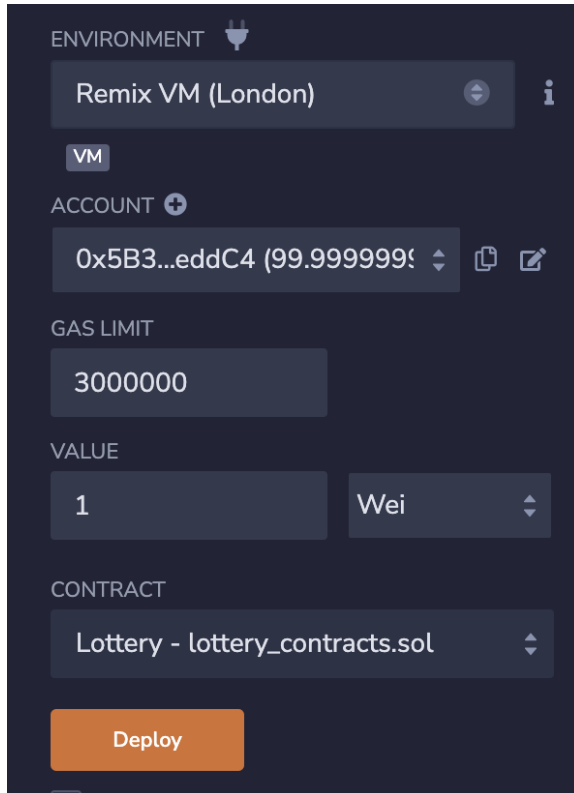
## To Do List

Here we create the task using create function then I use get function to see what to do list we have and that save it in Todo list



# Lottery Contract:

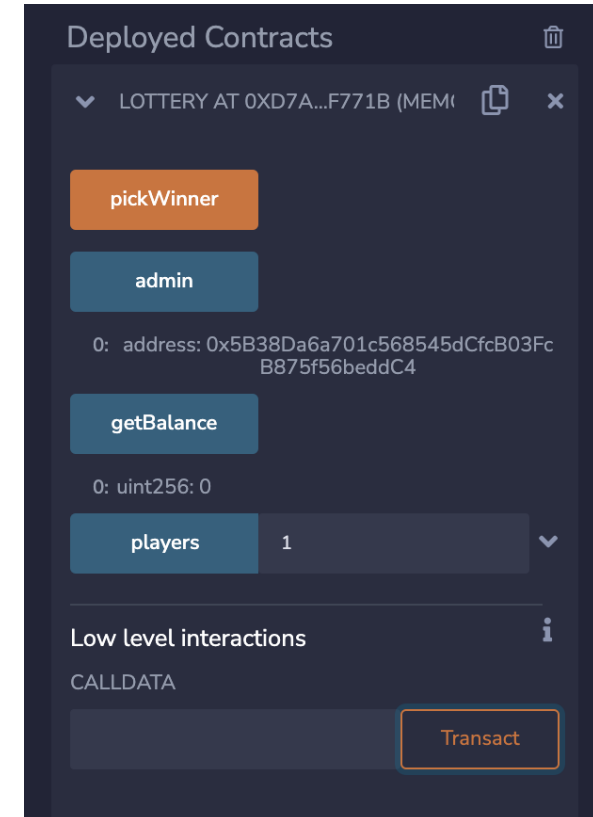
First we add an admin account



The screenshot shows the Remix IDE interface with the following configuration:

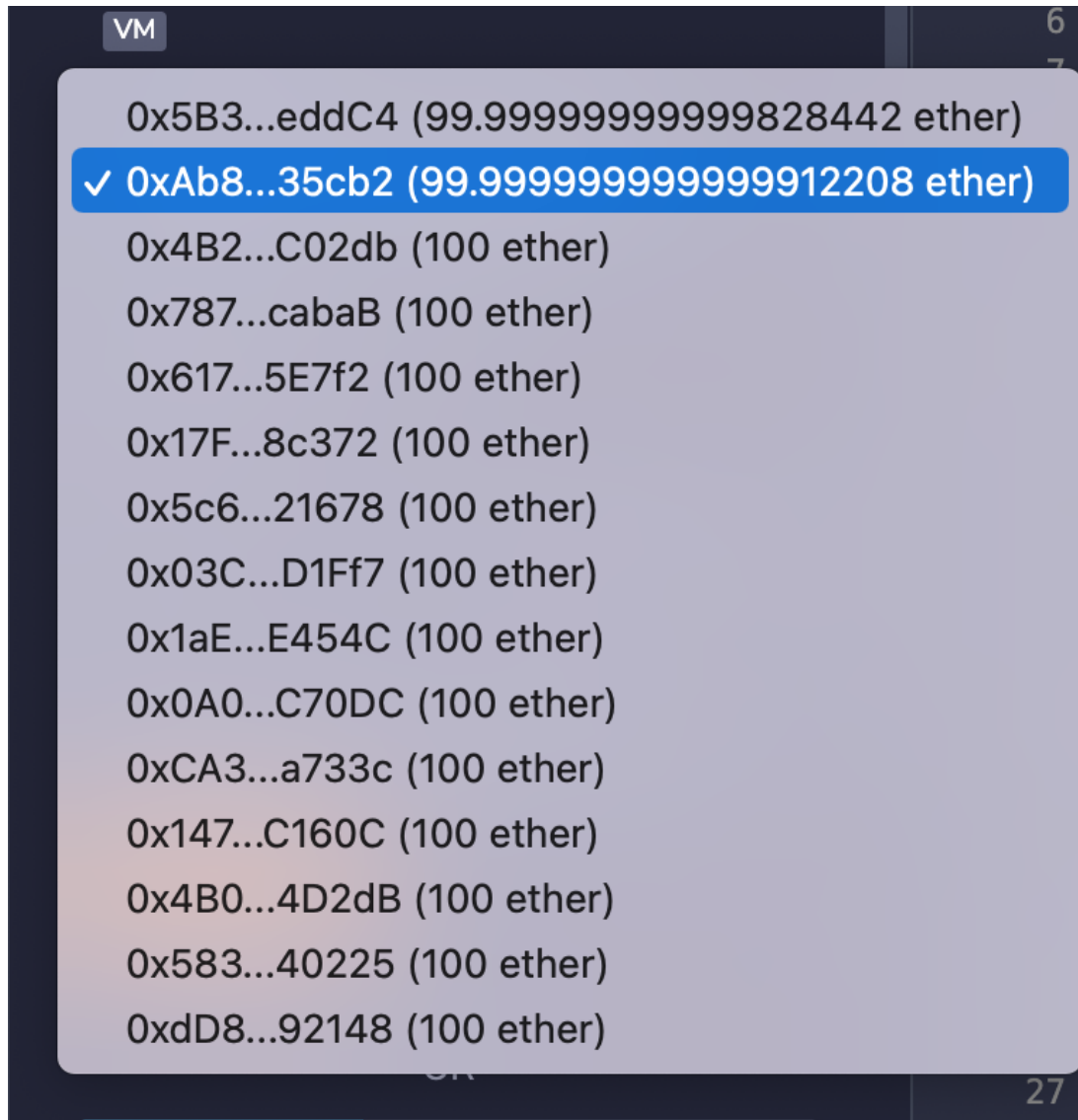
- ENVIRONMENT:** Remix VM (London)
- ACCOUNT:** 0x5B3...eddC4 (99.999999%)
- GAS LIMIT:** 3000000
- VALUE:** 1 Wei
- CONTRACT:** Lottery - lottery\_contracts.sol
- Deploy** button is visible at the bottom.

Second keep adding players  
should be 3 or more



The screenshot shows the 'Deployed Contracts' panel with the following details:

- Contract Name:** LOTTERY AT 0XD7A...F771B (MEMI)
- pickWinner** button
- admin** button
- getBalance** button
- players** dropdown menu set to 1
- Low level interactions** section with a **Transact** button

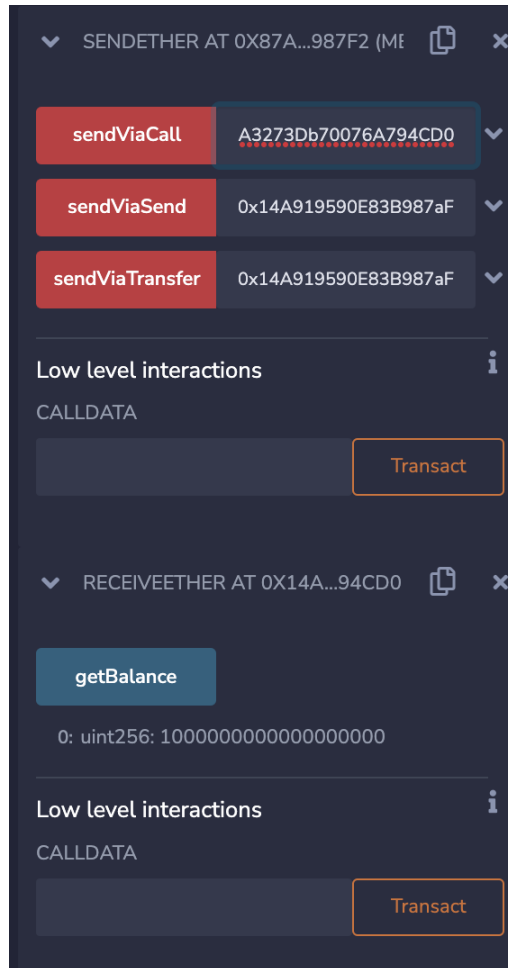


We add three accounts the admin and two players each account have at least 0.1 ether and the winner account will have 0.1 more.



# Transfer Ether Contract

Three methods to send Ether. All of them used to send Ether as a sender to another receiver account.

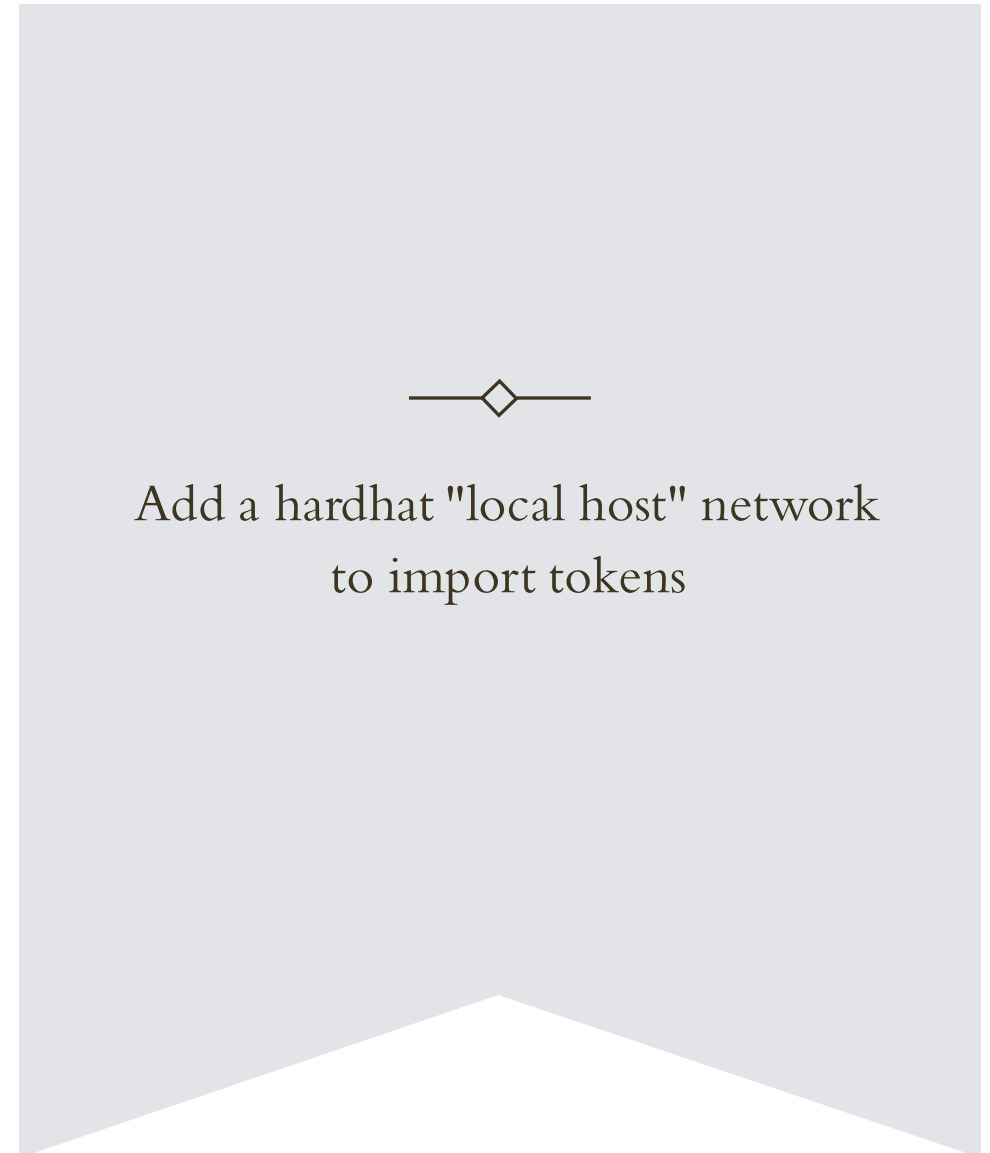
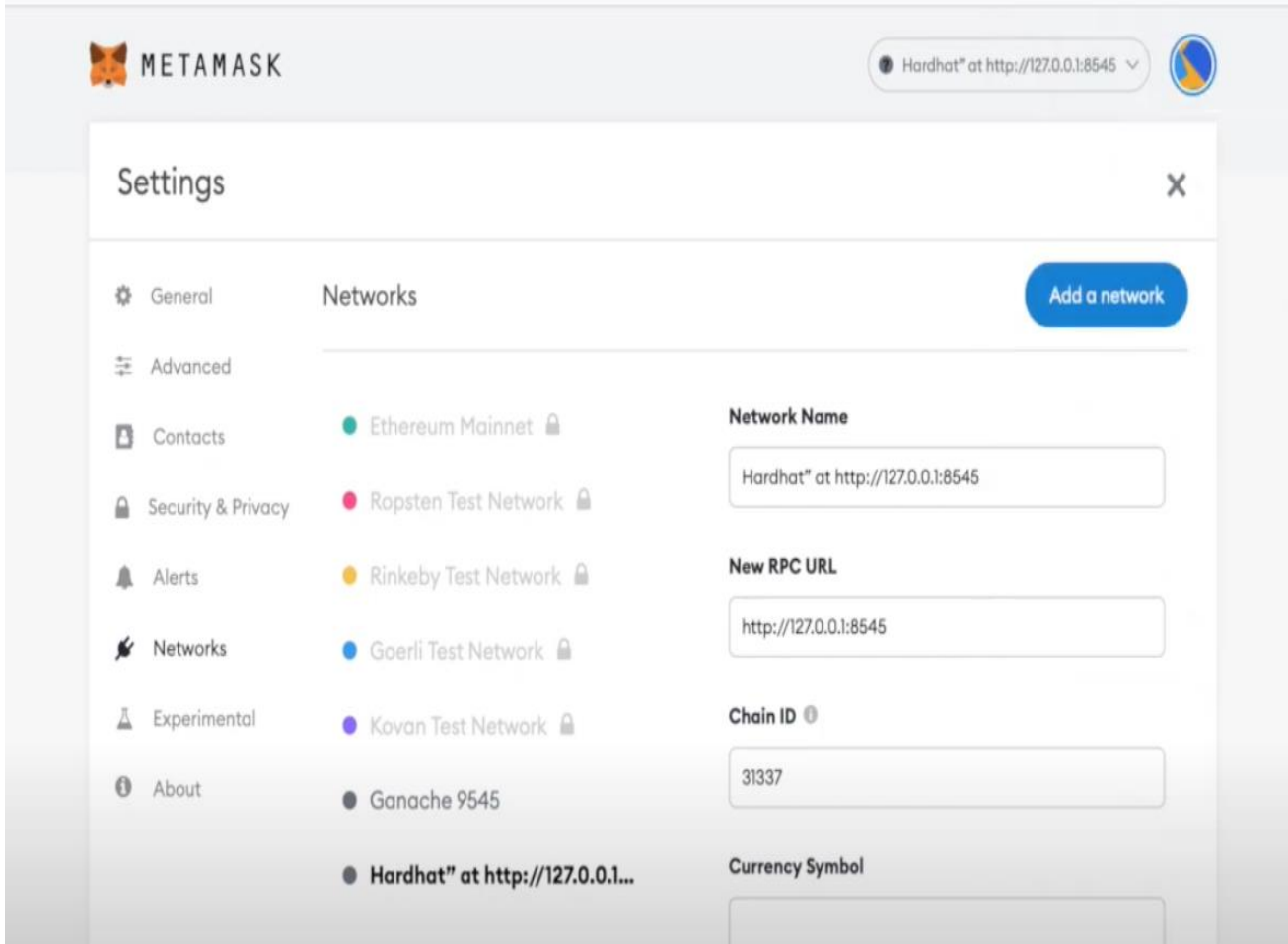


# Milestone 4

Fullstack Banking Dapp

Deposit & Withdraw ETH & ERC20 Tokens with  
MetaMask





This is our wallet with  
all the tokens that we  
imported to metamask  
wallet



Welcome 0x70997970...

MATIC 0.00

Deposit/Withdraw

SHIB 0.00

Deposit/Withdraw

USDT 0.00

Deposit/Withdraw

ETH 0.00

Deposit/Withdraw

Welcome 0x70997970...

### MATIC

Amount

DepositWithdraw

Close

Here we want to deposit some Matic and ETH to each account.

Welcome 0x70997970...

### ETH

Amount

DepositWithdraw

Close



Welcome 0x70997970...

MATIC	1000.00	Deposit/Withdraw
SHIB	0.00	Deposit/Withdraw
USDT	0.00	Deposit/Withdraw
ETH	10.00	Deposit/Withdraw

By this our wallet balance for MATIC and  
ETHER will change to 1000 and 100  
accordingly.

