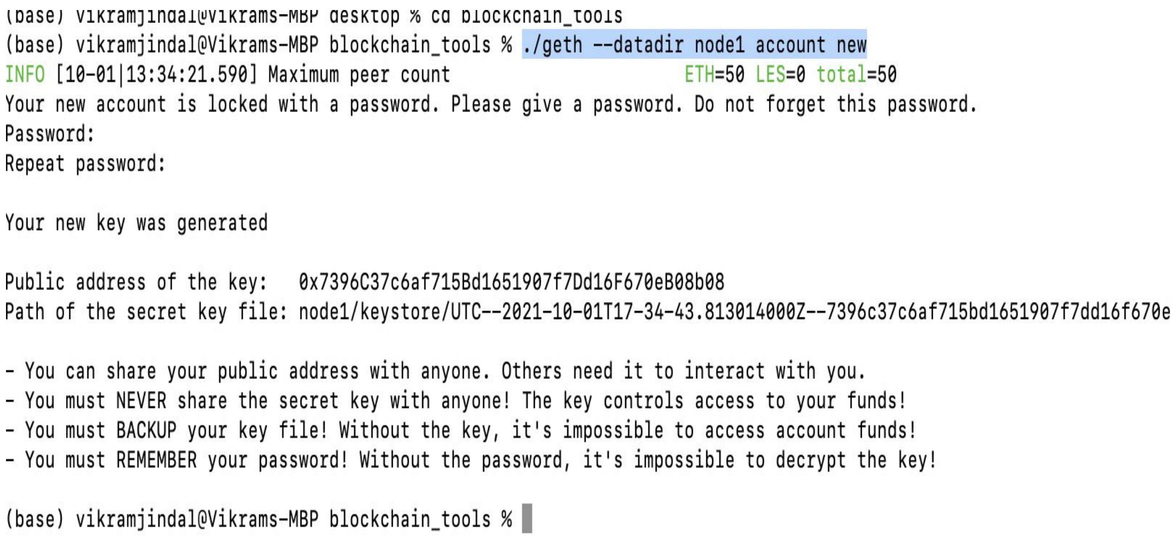
BLOCKCHAIN TRANSACTIONS

BY REKHA BHARATHIMANGALAM RAMACHANDRAN

PROJECT

This project demonstrates the creation and testing of blockchain transactions

Creation of the first Node1/Account



```
(base) vikramjindal@Vikrams-MBP desktop % cd blockchain_tools
(base) vikramjindal@Vikrams-MBP blockchain_tools % ./geth --datadir node1 account new
INFO [10-01|13:34:21.590] Maximum peer count                       ETH=50 LES=0 total=50
Your new account is locked with a password. Please give a password. Do not forget this password.
Password:
Repeat password:

Your new key was generated

Public address of the key:   0x7396C37c6af715Bd1651907f7Dd16F670eB08b08
Path of the secret key file: node1/keystore/UTC--2021-10-01T17-34-43.813014000Z--7396c37c6af715bd1651907f7dd16f670e

- You can share your public address with anyone. Others need it to interact with you.
- You must NEVER share the secret key with anyone! The key controls access to your funds!
- You must BACKUP your key file! Without the key, it's impossible to access account funds!
- You must REMEMBER your password! Without the password, it's impossible to decrypt the key!

(base) vikramjindal@Vikrams-MBP blockchain_tools %
```

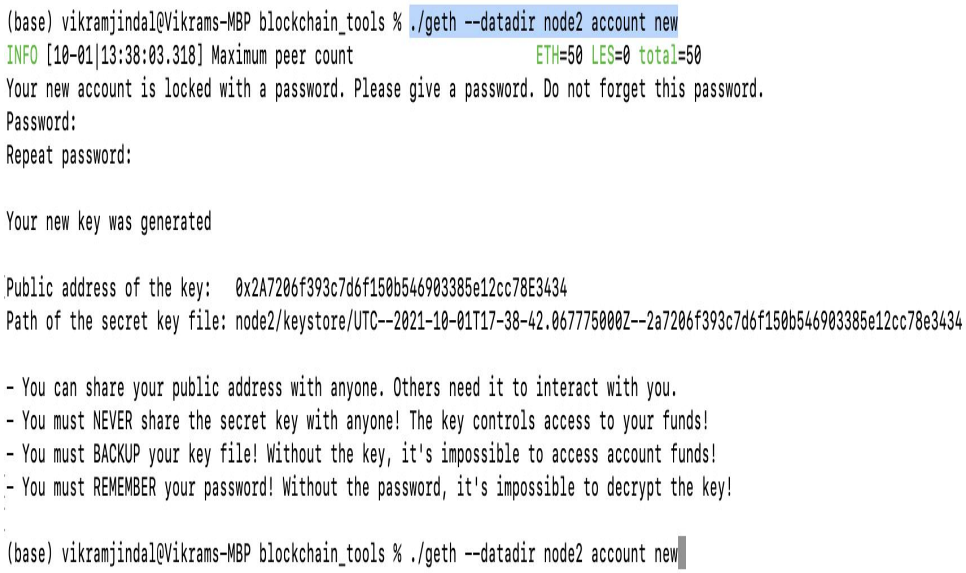
- Create account/Node1 using the terminal at the folder where geth & puppeth functions are installed.

  * ./geth --datadir node1 account new

- Provide a password to unlock the Node 1/Account. Remember it for future use.

- Copy the public address and private key generated in a text file for future use.

Creation of the Second Node2/Account



```
(base) vikramjindal@Vikrams-MBP blockchain_tools % ./geth --datadir node2 account new
INFO [10-01|13:38:03.318] Maximum peer count                       ETH=50 LES=0 total=50
Your new account is locked with a password. Please give a password. Do not forget this password.
Password:
Repeat password:

Your new key was generated

Public address of the key:   0x2A7206f393c7d6f150b546903385e12cc78E3434
Path of the secret key file: node2/keystore/UTC--2021-10-01T17-38-42.067775000Z--2a7206f393c7d6f150b546903385e12cc78e3434

- You can share your public address with anyone. Others need it to interact with you.
- You must NEVER share the secret key with anyone! The key controls access to your funds!
- You must BACKUP your key file! Without the key, it's impossible to access account funds!
- You must REMEMBER your password! Without the password, it's impossible to decrypt the key!

(base) vikramjindal@Vikrams-MBP blockchain_tools % ./geth --datadir node2 account new
```

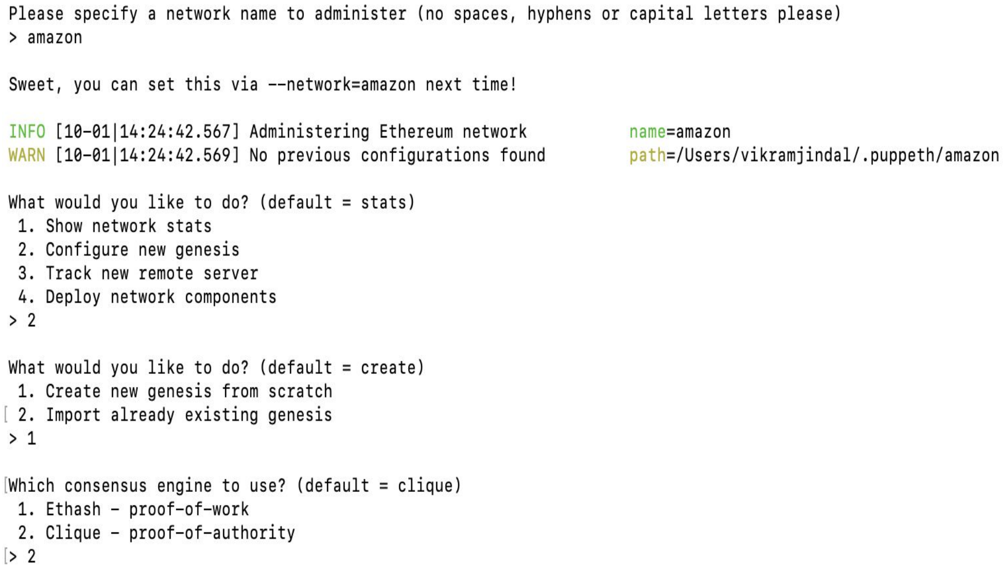
- Next Create the Node 2/Account at the terminal using geth command

./geth --datadir node2 account new

- Provide a password to unlock the Node 2/Account. Remember it for future use.

- Copy the public address and private key generated in a text file for future use.

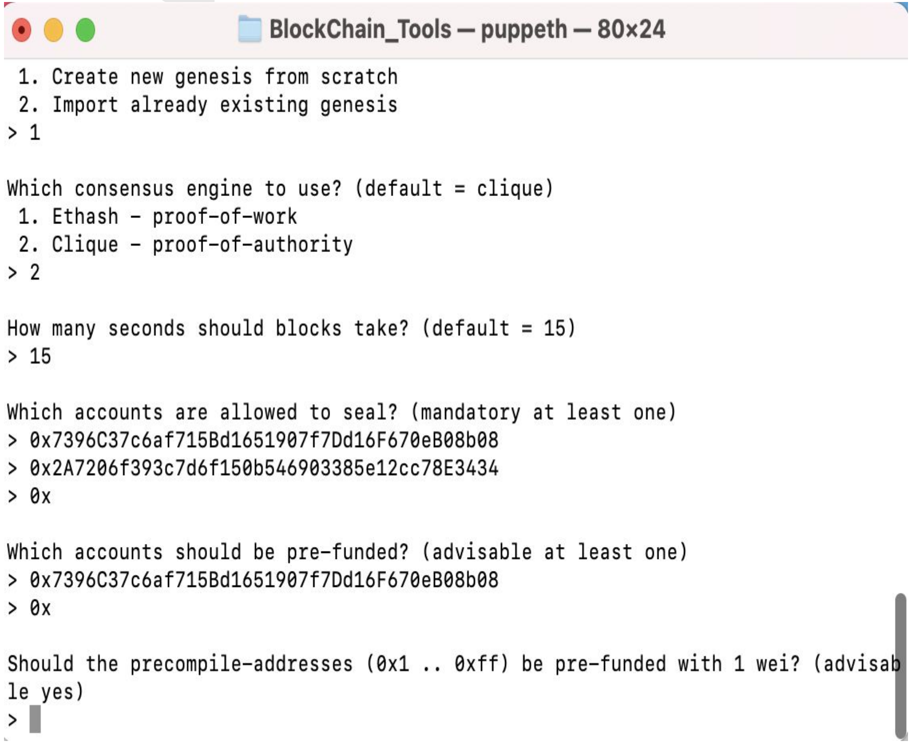
Create & Configure Genesis Network



```
Please specify a network name to administer (no spaces, hyphens or capital letters please)
> amazon

Sweet, you can set this via --network=amazon next time!

INFO [10-01|14:24:42.567] Administering Ethereum network        name=amazon
WARN [10-01|14:24:42.569] No previous configurations found      path=/Users/vikramjindal/.puppeth/amazon

What would you like to do? (default = stats)
 1. Show network stats
 2. Configure new genesis
 3. Track new remote server
 4. Deploy network components
> 2

What would you like to do? (default = create)
 1. Create new genesis from scratch
[ 2. Import already existing genesis
> 1

[Which consensus engine to use? (default = clique)
 1. Ethash - proof-of-work
 2. Clique - proof-of-authority
[> 2
```

- Next, generate your genesis block.
- Run `puppeth`, name your network(Ex:amazon), and select the option to configure a new genesis block.
- Choose the `Clique (Proof of Authority)` consensus algorithm.

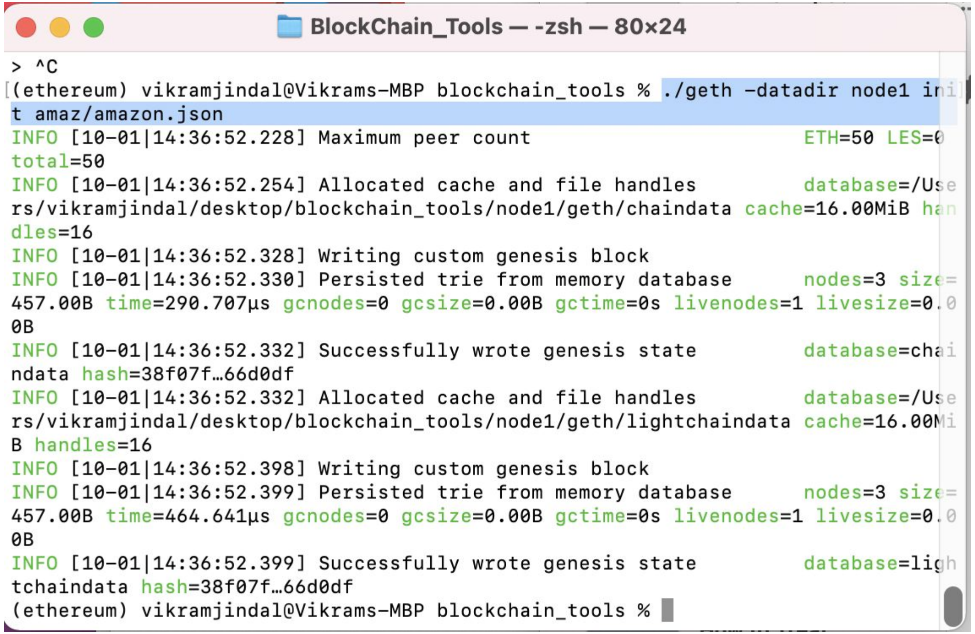
Seal & Prefund the Accounts



```
 1. Create new genesis from scratch
 2. Import already existing genesis
> 1

Which consensus engine to use? (default = clique)
 1. Ethash - proof-of-work
 2. Clique - proof-of-authority
> 2

How many seconds should blocks take? (default = 15)
> 15

Which accounts are allowed to seal? (mandatory at least one)
> 0x7396C37c6af715Bd1651907f7Dd16F670eB08b08
> 0x2A7206f393c7d6f150b546903385e12cc78E3434
> 0x

Which accounts should be pre-funded? (advisable at least one)
> 0x7396C37c6af715Bd1651907f7Dd16F670eB08b08
> 0x

Should the precompile-addresses (0x1 .. 0xff) be pre-funded with 1 wei? (advisab
le yes)
> 
```

- Paste both account addresses from the first step one at a time into the list of accounts to seal.
- Paste them again in the list of accounts to pre-fund. There are no block rewards in PoA, so you'll need to pre-fund.
- Continue with the default option for the prompt that asks, Should the precompile-addresses (0x1 .. 0xff) be pre-funded with 1 wei?
- Complete the rest of the prompts, and when you are asked to choose a folder for the network update a folder name.(Ex: amaz)
- At the main menu, choose the "Manage existing genesis" option
- Complete the Export genesis configurations. This will fail to create two of the files, but you only need `networkname.json`.(Ex: “amazon.json”)

Initialize Node1/Account



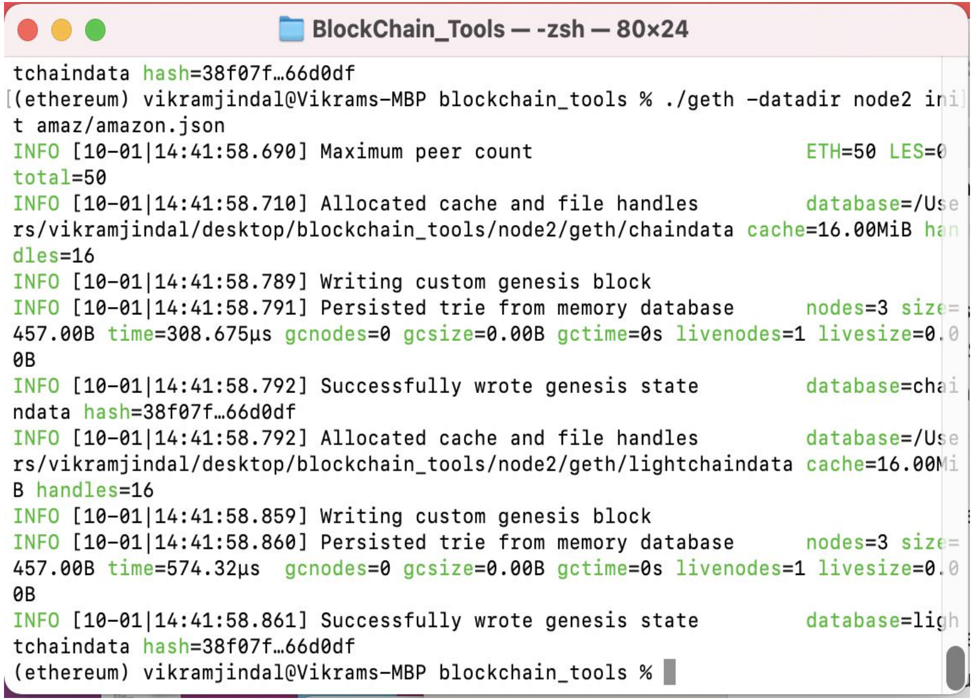
```
> ^C
[(ethereum) vikramjindal@Vikrams-MBP blockchain_tools % ./geth -datadir node1 ini
t amaz/amazon.json
INFO [10-01|14:36:52.228] Maximum peer count                       ETH=50 LES=0
total=50
INFO [10-01|14:36:52.254] Allocated cache and file handles         database=/Use
rs/vikramjindal/desktop/blockchain_tools/node1/geth/chaindata cache=16.00MiB han
dles=16
INFO [10-01|14:36:52.328] Writing custom genesis block
INFO [10-01|14:36:52.330] Persisted trie from memory database      nodes=3 size=
457.00B time=290.707µs gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.0
0B
INFO [10-01|14:36:52.332] Successfully wrote genesis state         database=chai
ndata hash=38f07f…66d0df
INFO [10-01|14:36:52.332] Allocated cache and file handles         database=/Use
rs/vikramjindal/desktop/blockchain_tools/node1/geth/lightchaindata cache=16.00Mi
B handles=16
INFO [10-01|14:36:52.398] Writing custom genesis block
INFO [10-01|14:36:52.399] Persisted trie from memory database      nodes=3 size=
457.00B time=464.641µs gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.0
0B
INFO [10-01|14:36:52.399] Successfully wrote genesis state         database=ligh
tchaindata hash=38f07f…66d0df
(ethereum) vikramjindal@Vikrams-MBP blockchain_tools % 
```

- We will now initialize the node1 with the genesis' json file.
- Using `geth`, initialize each node with the new `networkname.json`.

  * ./geth --datadir node1 init networkname.json

- (Ex : ./geth --datadir node1 init amaz/amazon..json)

Initialize Node2/Account



```
tchaindata hash=38f07f…66d0df
[(ethereum) vikramjindal@Vikrams-MBP blockchain_tools % ./geth -datadir node2 ini]
t amaz/amazon.json
INFO [10-01|14:41:58.690] Maximum peer count                       ETH=50 LES=0
total=50
INFO [10-01|14:41:58.710] Allocated cache and file handles         database=/Use
rs/vikramjindal/desktop/blockchain_tools/node2/geth/chaindata cache=16.00MiB han
dles=16
INFO [10-01|14:41:58.789] Writing custom genesis block
INFO [10-01|14:41:58.791] Persisted trie from memory database      nodes=3 size=
457.00B time=308.675µs gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.0
0B
INFO [10-01|14:41:58.792] Successfully wrote genesis state         database=chai
ndata hash=38f07f…66d0df
INFO [10-01|14:41:58.792] Allocated cache and file handles         database=/Use
rs/vikramjindal/desktop/blockchain_tools/node2/geth/lightchaindata cache=16.00Mi
B handles=16
INFO [10-01|14:41:58.859] Writing custom genesis block
INFO [10-01|14:41:58.860] Persisted trie from memory database      nodes=3 size=
457.00B time=574.32µs  gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.0
0B
INFO [10-01|14:41:58.861] Successfully wrote genesis state         database=ligh
tchaindata hash=38f07f…66d0df
(ethereum) vikramjindal@Vikrams-MBP blockchain_tools % 
```

- Initialize the node2 with the genesis' json file.

  ./geth --datadir node2 init networkname.json

- (Ex : ./geth --datadir node2 init amaz/amazon..json)

RUN The NODES/Account

- Now the nodes can be used to begin mining blocks.
- Run the nodes in separate terminal windows with the commands:

```
* ./geth --datadir node1 --unlock "SEALER_ONE_ADDRESS" --mine --rpc --allow-insecure-unlock
```

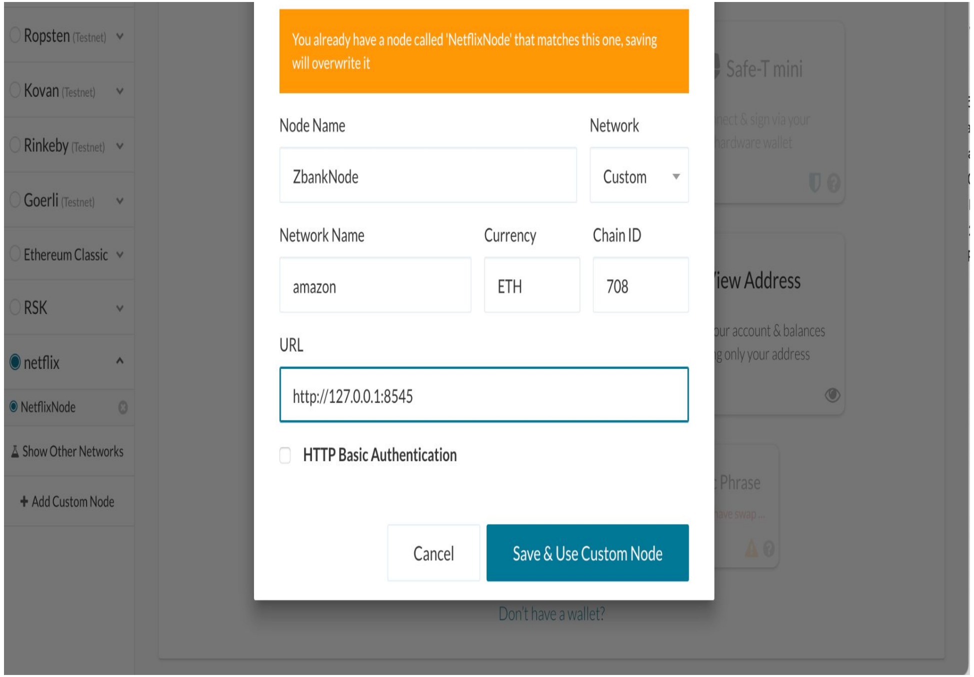
* **NOTE**:SEALER_ONE_ADDRESS is your Node1 public key

```
* ./geth --datadir node2 --unlock "SEALER_TWO_ADDRESS" --mine --port 30304 --bootnodes "enode://SEALER_ONE_ENODE_ADDRESS@127.0.0.1:30303" --ipcdisable --allow-insecure-unlock
```

NOTE:SEALER_TWO_ADDRESS is your Node2 public key
***NOTE**enode://SEALER_ONE_ENODE_ADDRESS@127.0.0.1:30303" is generated when Node 1 is RUN
(Ex:enode://91f912b9e8a9677c355c65e701c148471eda188dc097d1d3d5e2c9d7f9c2c6baa602fc04dcb9a15d8394e75bb63f992cb2267fe1b8e68156546949cbd2de8c32@127.0.0.1:30303)

* **NOTE:** Type your password and hit enter - even if you can't see it visually!

Set up your custom node in MyCrypto



You already have a node called 'NetflixNode' that matches this one, saving will overwrite it

Node Name: ZbankNode

Network: Custom

Network Name: amazon

Currency: ETH

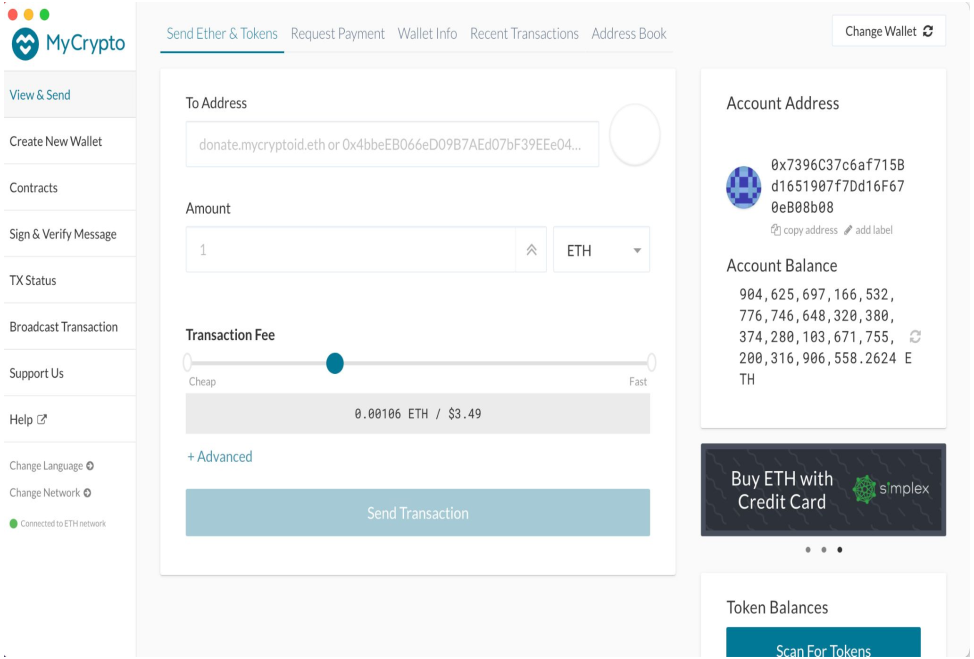
Chain ID: 708

URL: http://127.0.0.1:8545

□ HTTP Basic Authentication

- Your private PoA blockchain should now be running!
- With both nodes up and running, the blockchain can be added to MyCrypto for testing.
- Open the MyCrypto app, then click `Change Network` at the bottom left:
- Click "Add Custom Node", then add the custom network information that you set in the genesis.
- Make sure that you scroll down to choose `Custom` in the "Network" column to reveal more options like `Chain ID`:
- Type `ETH` in the Currency box.
- In the Chain ID box, type the chain id you generated during genesis creation.
- In the URL box type: `http://127.0.0.1:8545`. This points to the default RPC port on your local machine.
- Finally, click `Save & Use Custom Node`.

View Prefund ETH Amount in MyCrypto



To Address

donate.mycryptoid.eth or 0x4bbeEB066eD09B7AEd07bF39EEe04...

Amount

1 ETH

Transaction Fee

0.00106 ETH / $3.49

Account Address

0x7396C37c6af715Bd1651907f7Dd16F670eB08b08

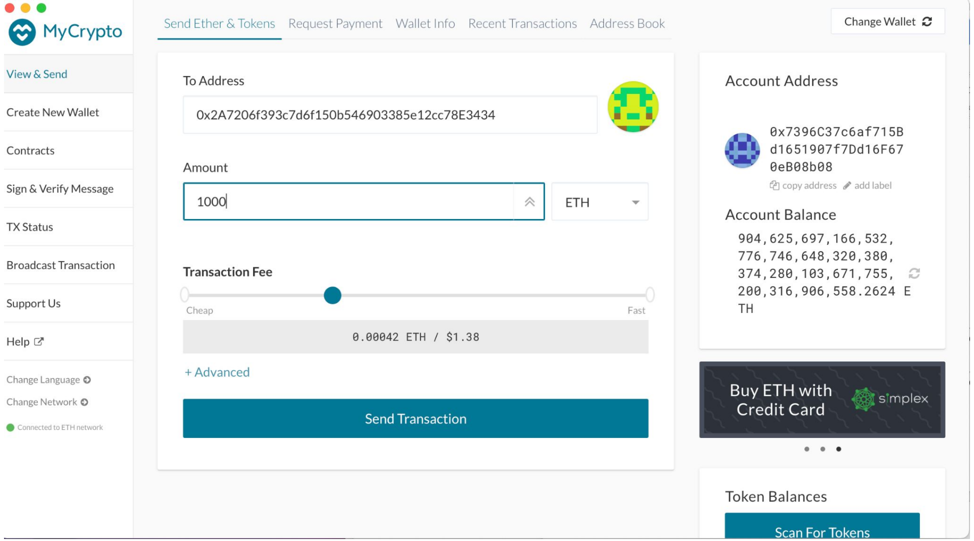
Account Balance

904,625,697,166,532,776,746,648,320,380,374,280,103,671,755,200,316,906,558.2624 ETH

Token Balances

- In View & Send Select Keystore file
- Next Select Wallet Info
- Go to your prefunded Node(Ex:Node 1) to your keystore folder select the file.
- Enter Node password when requested(Ex: Node 1)
- Press Unlock
- You are filthy rich !!!

Transfer ETH Amount To Recipient



To Address: 0x2A7206f393c7d6f150b546903385e12cc78E3434

Amount: 1000 ETH

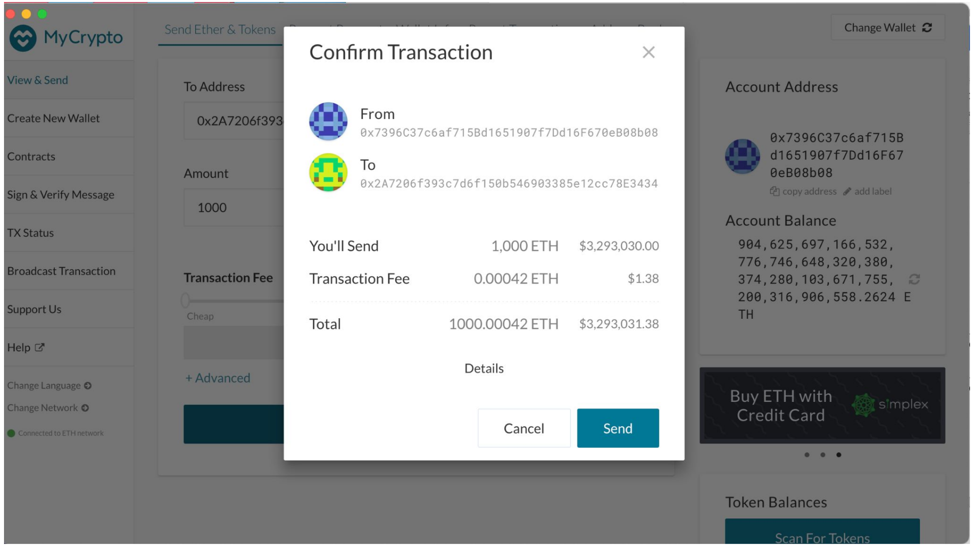
Transaction Fee: 0.00042 ETH / $1.38

Account Address: 0x7396C37c6af715Bd1651907f7Dd16F670eB08b08

Account Balance: 904,625,697,166,532,776,746,648,320,380,374,280,103,671,755,200,316,906,558.2624 ETH

- Select Send Ether & Tokens
- Enter To address (Ex:Node 2 Public Key)
- Enter amount (Ex:1000)to transfer.
- Click on Send Transaction

Confirm ETH Transaction in MyCrypto



To Address

0x2A7206f393

Amount

1000

Transaction Fee

Confirm Transaction

From
0x7396C37c6af715Bd1651907f7Dd16F670eB08b08

To
0x2A7206f393c7d6f150b546903385e12cc78E3434

You'll Send	1,000 ETH	$3,293,030.00
Transaction Fee	0.00042 ETH	$1.38
Total	1000.00042 ETH	$3,293,031.38

Details

Cancel Send

Account Address

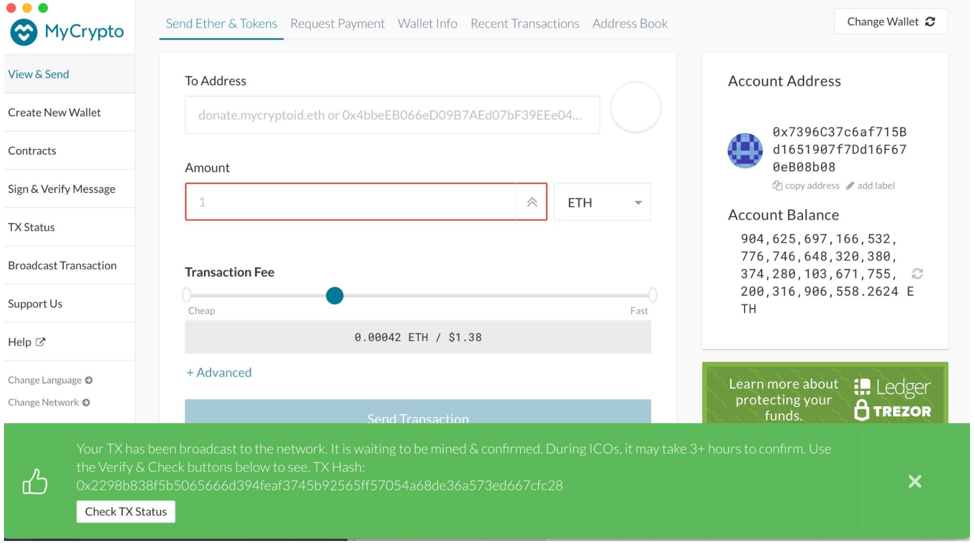
0x7396C37c6af715Bd1651907f7Dd16F670eB08b08

Account Balance

904,625,697,166,532,776,746,648,320,380,374,280,103,671,755,200,316,906,558.2624 ETH

- Verify the from address(Ex: Node1 public key) and To address(Ex: Node2 public key)
- Verify ETH amount transferred(Ex:1000).
- Click the Send Button

Check Transaction Status in MyCrypto



To Address

donate.mycryptoid.eth or 0x4bbeEB066eD09B7AEd07bF39EEe04...

Amount

1 ETH

Transaction Fee

0.00042 ETH / $1.38

Account Address

0x7396C37c6af715Bd1651907f7Dd16F670eB08b08

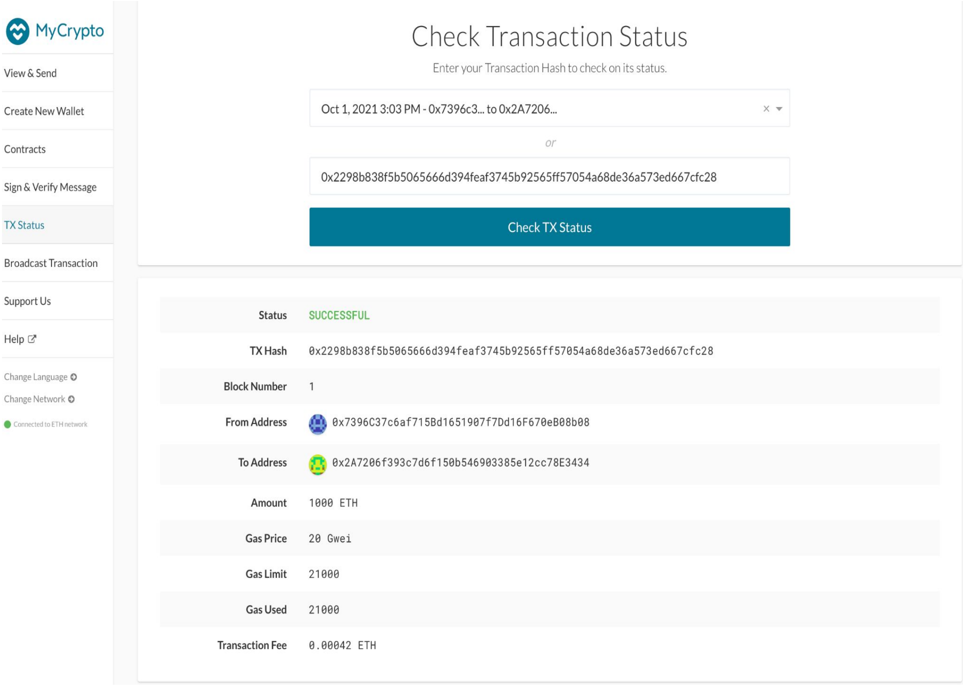
Account Balance

904,625,697,166,532,776,746,648,320,380,374,280,103,671,755,200,316,906,558.2624 ETH

Your TX has been broadcast to the network. It is waiting to be mined & confirmed. During ICOs, it may take 3+ hours to confirm. Use the Verify & Check buttons below to see. TX Hash: 0x2298b838f5b5065666d394feaf3745b92565ff57054a68de36a573ed667cfc28

- To check the transfer of ETH amount click on the CheckTxStatus.

Transaction Success in MyCrypto



Check Transaction Status

Enter your Transaction Hash to check on its status.

Oct 1, 2021 3:03 PM - 0x7396c3... to 0x2A7206...

or

0x2298b838f5b5065666d394feaf3745b92565ff57054a68de36a573ed667cfc28

Status	SUCCESSFUL
TX Hash	0x2298b838f5b5065666d394feaf3745b92565ff57054a68de36a573ed667cfc28
Block Number	1
From Address	0x7396C37c6af715Bd1651907f7Dd16F670eB08b08
To Address	0x2A7206f393c7d6f150b546903385e12cc78E3434
Amount	1000 ETH
Gas Price	20 Gwei
Gas Limit	21000
Gas Used	21000
Transaction Fee	0.00042 ETH

- Select the transaction in the dropdown box
- Else,, you can update the TxHash in the box
- Click on Check Tx Status.
- Status should display Success.
- This completes the transfer of ETH amount to the recipient address (Ex: Node 2)