

Ethereum Getting Started

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1 Installation

1.1 Go Ethereum

- Official Go implementation of the Ethereum protocol
- Go Ethereum is available either as a standalone client called **Geth** that you can install on pretty much any operating system, or as a library that you can embed in your Go, Android or iOS projects.
- Has the following two components.

1.1.1 JSON-RPC Server

- Geth supports all standard web3 JSON-RPC APIs.
- API reference: <https://eth.wiki/json-rpc/API>

1.1.2 Javascript Console

- The Geth JavaScript console exposes the full web3 JavaScript Dapp API and further administrative APIs.

1.1.3 Ubuntu

```
sudo add-apt-repository -y ppa:ethereum/ethereum
sudo apt-get update
sudo apt-get install ethereum
```

1.2 Node JS

1.2.1 Ubuntu

Install Node Version Manager(NVM) - POSIX-compliant bash script to manage multiple active node.js versions

```
curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.38.0/install.sh | bash
source ~/.bashrc
```

Install latest LTS version of node.js

```
nvm install --lts
```

2 Configure the Genesis file

save the following contents as **genesis.json** in a directory

```
{
  "coinbase"   : "0x0000000000000000000000000000000000000000000000000000000000000001",
  "difficulty" : "0x400",
  "extraData"  : "",
  "gasLimit"   : "0x8000000",
  "nonce"      : "0x00000000000000042",
  "mixhash"    : "0x0000000000000000000000000000000000000000000000000000000000000000",
  "parentHash" : "0x0000000000000000000000000000000000000000000000000000000000000000",
  "timestamp"  : "0x00",
  "alloc": {},
  "config": {
    "chainId": 15,
    "homesteadBlock": 0,
    "eip150Block": 0,
    "eip155Block": 0,
    "eip158Block": 0
  }
}
```

Config File Fields:

- chainId: Unique identifier of the new private blockchain
- homesteadBlock: first production release of ethereum
- eip155Block/eip158Block: EIP - Ethereum Improvement Proposals
- difficulty: controls the complexity of the mining puzzle
- gaslimit: upper limit for executing smart contracts
- alloc: allocation of ether to a specific address

3 Initialize the network

```
geth --rpc --rpcport "8545" --datadir ./chaindata/TestChain init ./genesis.json
```

4 Start the network with a single node

```
geth --rpc --rpcport "8545" --datadir ./chaindata/TestChain --networkid 123 \  
    --nodiscover --rpccorsdomain "*" --allow-insecure-unlock
```

5 Open Geth Console

```
geth attach ./chaindata/TestChain/geth.ipc
```

6 Interact with the network using Geth Console

1. Create account

```
personal.newAccount()
```

Note down the passphrase and the address

2. Check balance

```
eth.getBalance("ENTER_ACCOUNT_ADDRESS_HERE")
```

3. Balance is 0 initially. There are two ways to get ether to your account:

- Mine blocks
- Someone sends you some ether

4. To mine ether to your account: run this for few seconds

```
miner.start()
```

5. Stop mining:

```
miner.stop()
```

6. Check the balance again.

```
eth.getBalance("ENTER_ACCOUNT_ADDRESS_HERE")
```

7 Create another account

```
personal.newAccount()
```

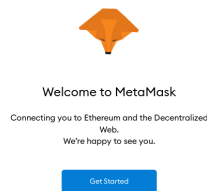
8 Making a transaction

```
> eth.getBalance("0x05b4f04d102de025345396185ae84238fe8557b5")
1.135e+21
> personal.unlockAccount( "0x05b4f04d102de025345396185ae84238fe8557b5","admin123")
true
> var sender = "0x05b4f04d102de025345396185ae84238fe8557b5"
undefined
> var receiver = "0xedf17456b236003c07f4ee6e25675f1214bf2c01"
undefined
> var amount = web3.toWei(1, "ether")
undefined
> eth.sendTransaction({from:sender, to:receiver, value: amount})
"0x74f85496acbbf61381437c0872e3045e02edef09cfc3e905e13fe67cab61388a"
```

9 MetaMask

MetaMask is a software cryptocurrency wallet used to interact with the Ethereum blockchain. Install the firefox or chrome extension. For firefox, use the following link, <https://addons.mozilla.org/en-US/firefox/addon/ether-metamask/>

9.1 Create a default wallet





New to MetaMask?



No, I already have a seed phrase
Import your existing wallet using a 12 word seed phrase

Import wallet



Yes, let's get set up!
This will create a new wallet and seed phrase

Create a wallet



< Back

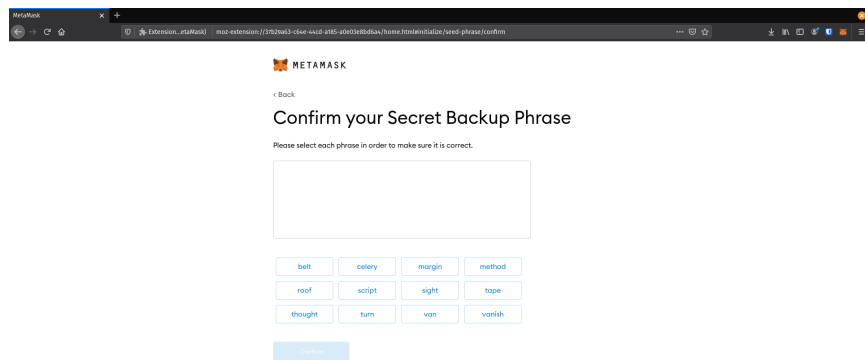
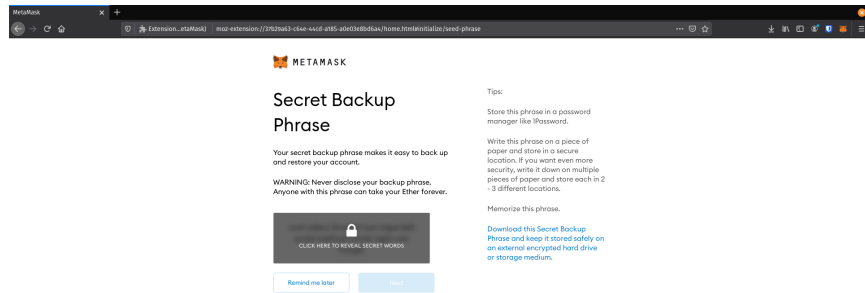
Create Password

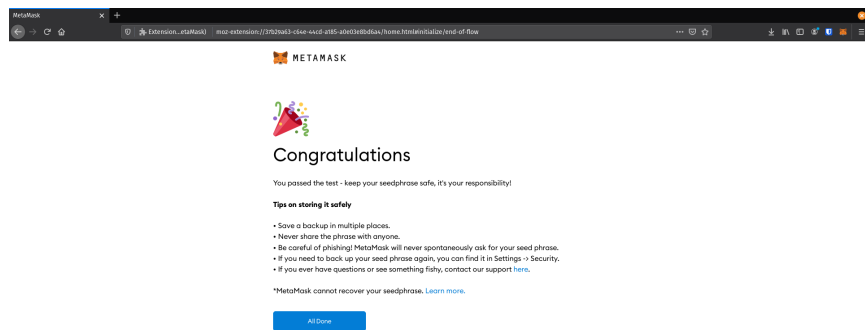
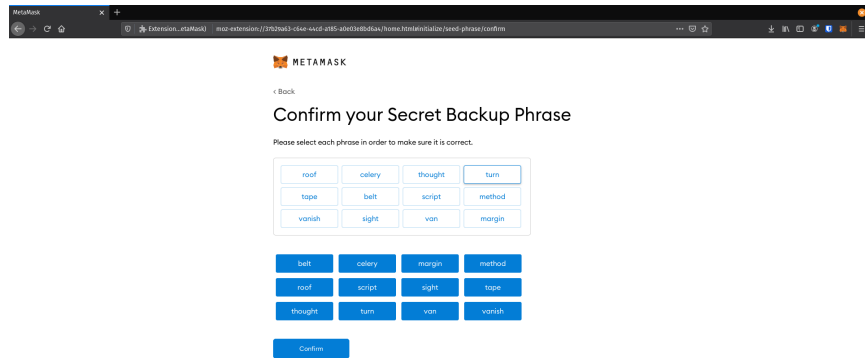
New password (min 8 chars)

Confirm password

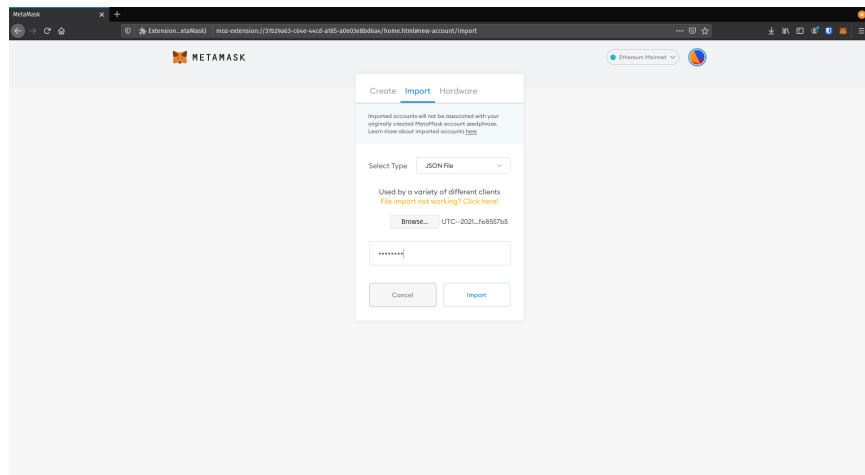
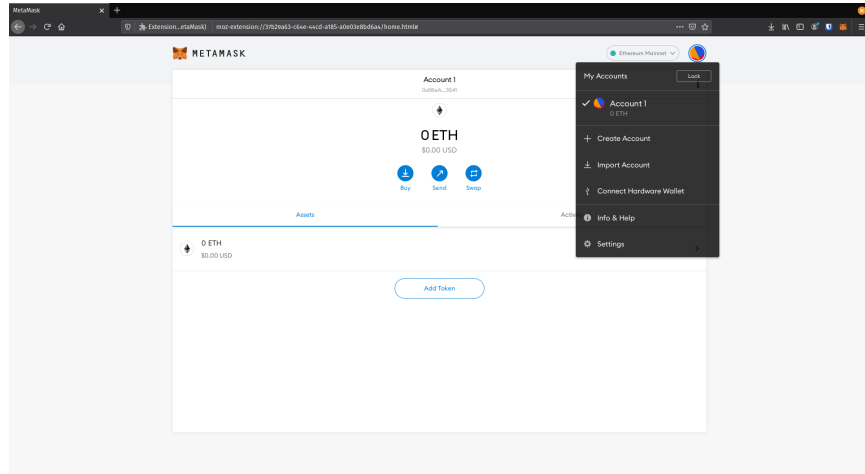
☐ I have read and agree to the [Terms of Use](#)

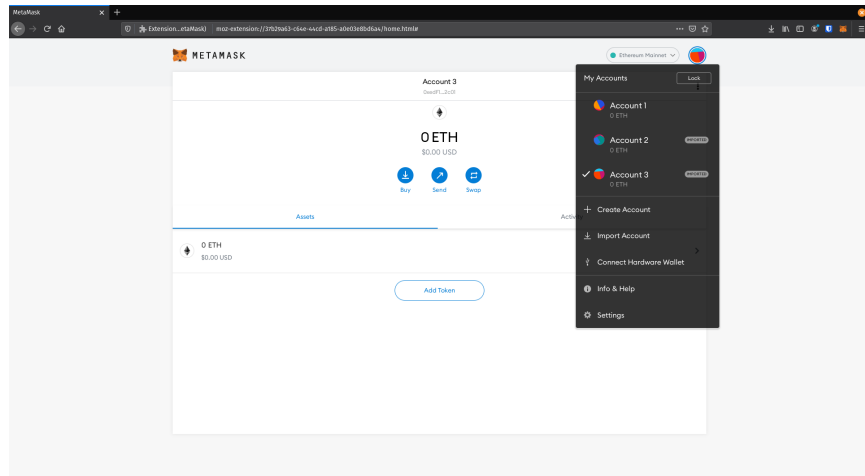
Create



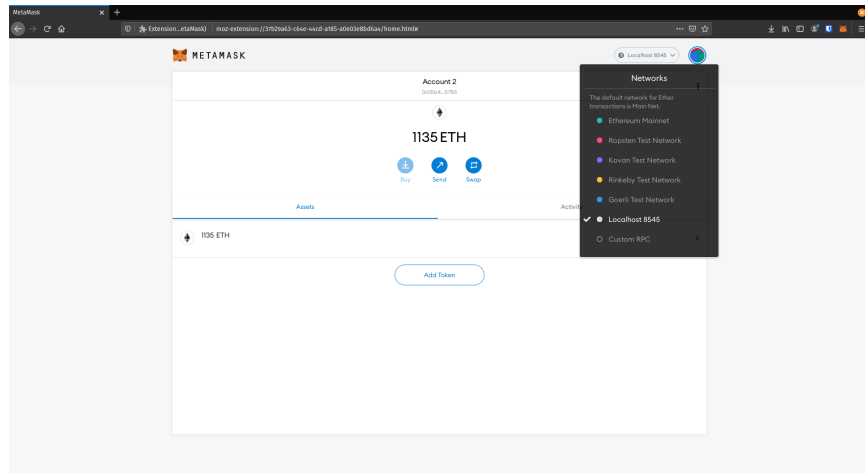


9.2 Import the accounts created in Geth console to MetaMask

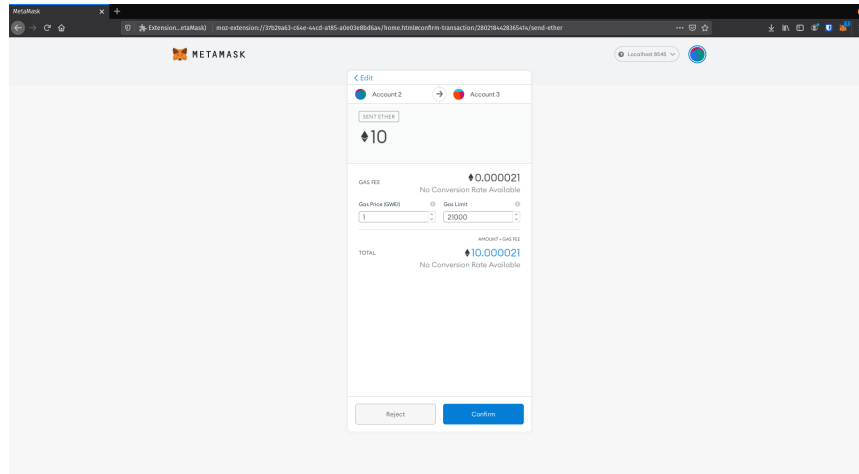




9.3 Connect the MetaMask to local ethereum network



9.4 Make transactions using MetaMask



10 Adding more nodes/peers

- use same genesis.json file
- use different data directory
- use the same network id
- default port number will be used by the first node so use a different port number using the flag: `-port 30306`

11 References

1. <https://geth.ethereum.org/docs/getting-started/private-net>