

2019 | By: Laurindo António



Tutorial 1

Report : Set up a private Blockchain network

Set up a private Blockchain network

Report : Set up a private Blockchain network

Creating Accounts for Ethereum Private Network

```
laurindo_antonio2240@instance-1:~$ mkdir private-ethereum
laurindo_antonio2240@instance-1:~$ cd private-ethereum
laurindo_antonio2240@instance-1:~/private-ethereum$ geth --datadir ./datadir account new
INFO [10-03|19:10:48.382] Maximum peer count          ETH=50 LES=0 total=50
INFO [10-03|19:10:48.382] Smartcard socket not found, disabling  err="stat /run/pcscd/pcscd.comm: no such file or directory"
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: 0x82c1Ee0A4393F3777fD90cB87553525b40c7e0D4
Path of the secret key file: datadir/keystore/UTC--2019-10-03T19-11-09.983944471Z--82c1ee0a4393f3777fd90cb87553525b40c7e0d4

- 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!

laurindo_antonio2240@instance-1:~/private-ethereum$ geth --datadir ./datadir account new
INFO [10-03|19:12:21.212] Maximum peer count          ETH=50 LES=0 total=50
INFO [10-03|19:12:21.212] Smartcard socket not found, disabling  err="stat /run/pcscd/pcscd.comm: no such file or directory"
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: 0xc1c2FC1eB3AB457e12D3cd9C1FAdba2447A8a6a7
Path of the secret key file: datadir/keystore/UTC--2019-10-03T19-12-41.355716052Z--c1c2fc1eb3ab457e12d3cd9c1fadba2447a8a6a7

- 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!

laurindo_antonio2240@instance-1:~/private-ethereum$
```

Creating Genesis File

```
GNU nano 2.9.3 genesis.json
{
  "config": {
    "chainId": 2019,
    "homesteadBlock": 0,
    "eip155Block": 0,
    "eip158Block": 0,
    "byzantiumBlock": 0
  },
  "difficulty": "400",
  "gasLimit": "2000000",
  "alloc": {
    "82c1Ee0A4393F3777fD90cB87553525b40c7e0D4" : {
      "balance": "1000000000000000000000"
    },
    "c1c2FC1eB3AB457e12D3cd9C1FAdba2447A8a6a7" : {
      "balance": "1200000000000000000000"
    }
  }
}
```

Instantiating Data Directory

```
laurindo_antonio2240@instance-1:~/private-ethereum$ geth --datadir ./myDataDir init ./genesis.json
INFO [10-03|19:44:33.643] Maximum peer count ETH=50 LES=0 total=50
INFO [10-03|19:44:33.644] Smartcard socket not found, disabling err="stat /run/pcscd/pcscd.comm: no such file or directory"
ERROR [10-03|19:44:33.644] Failed to enumerate USB devices hub=ledger vendor=11415 failcount=1 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR [10-03|19:44:33.644] Failed to enumerate USB devices hub=trezor vendor=21324 failcount=1 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR [10-03|19:44:33.644] Failed to enumerate USB devices hub=trezor vendor=4617 failcount=1 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR [10-03|19:44:33.645] Failed to enumerate USB devices hub=ledger vendor=11415 failcount=2 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR [10-03|19:44:33.645] Failed to enumerate USB devices hub=trezor vendor=21324 failcount=2 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR [10-03|19:44:33.645] Failed to enumerate USB devices hub=trezor vendor=4617 failcount=2 err="failed
to initialize libusb: libusb: unknown error [code -99]"
INFO [10-03|19:44:33.645] Allocated cache and file handles database=/home/laurindo_antonio2240/private-ethere
um/myDataDir/geth/chaindata cache=16.00MiB handles=16
INFO [10-03|19:44:33.669] Writing custom genesis block nodes=3 size=413.00B time=64.452µs gcnodes=0 gcs
INFO [10-03|19:44:33.669] Persisted trie from memory database size=0.00B gctime=0s livenodes=1 livenessize=0.00B
INFO [10-03|19:44:33.670] Successfully wrote genesis state database=chaindata hash=da7ada_176e04
INFO [10-03|19:44:33.670] Allocated cache and file handles database=/home/laurindo_antonio2240/private-ethere
um/myDataDir/geth/lightchaindata cache=16.00MiB handles=16
INFO [10-03|19:44:33.677] Writing custom genesis block nodes=3 size=413.00B time=54.432µs gcnodes=0 gcs
INFO [10-03|19:44:33.677] Persisted trie from memory database size=0.00B gctime=0s livenodes=1 livenessize=0.00B
INFO [10-03|19:44:33.677] Successfully wrote genesis state database=lightchaindata hash=da7ada_176e04
laurindo_antonio2240@instance-1:~/private-ethereum$
```

Starting Ethereum Private Blockchain

```
laurindo_antonio2240@instance-1:~/private-ethereum$ geth --datadir ./myDataDir --networkid 2019 console 2>> Eth.log
Welcome to the Geth JavaScript console!

instance: Geth/v1.9.6-stable-bd059680/linux-amd64/go1.11.5
at block: 0 (Thu, 01 Jan 1970 00:00:00 UTC)
datadir: /home/laurindo_antonio2240/private-ethereum/myDataDir
modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0 txpool:1.0 web3:1.0
> |
```

Reading Logs

```
laurindo_antonio2240@instance-1:~/private-ethereum$ tail -f Eth.log
INFO [10-03|19:48:19.532] Allocated fast sync bloom          size=512.00MiB
INFO [10-03|19:48:19.533] Initialized fast sync bloom          items=3 errorrate=0.000 elapsed=168.056µs
INFO [10-03|19:48:19.547] New local node record                seq=1 id=f89907fcec8eb0ca ip=127.0.0.1 udp=30303
tcp=30303
INFO [10-03|19:48:19.550] IPC endpoint opened                  url=/home/laurindo_antonio2240/private-ethereum/
myDataDir/geth.ipc
INFO [10-03|19:48:19.553] Started P2P networking                self=enode://8755d0084226dd496517ba997672f91f7ee
855c0294fe3f9601283414036f6da545692d32e40ff409a832938750cd12fb5df856960460ab1843d481c6c0f714c@127.0.0.1:30303
WARN [10-03|19:48:19.676] Served eth_coinbase                  reqid=3 t=21.026µs err="etherbase must be explic
itly specified"
ERROR[10-03|19:48:20.414] Failed to enumerate USB devices       hub=trezor vendor=4617 failcount=3 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR[10-03|19:48:20.414] Failed to enumerate USB devices       hub=ledger vendor=11415 failcount=3 err="failed
to initialize libusb: libusb: unknown error [code -99]"
ERROR[10-03|19:48:20.415] Failed to enumerate USB devices       hub=trezor vendor=21324 failcount=3 err="failed
to initialize libusb: libusb: unknown error [code -99]"
INFO [10-03|19:48:20.858] New local node record                seq=2 id=f89907fcec8eb0ca ip=35.193.200.228 udp=
30303 tcp=30303
|
```

Importing accounts to Private Network

```
laurindo_antonio2240@instance-1:~$ cp private-ethereum/datadir/keystore/* private-ethereum/myDataDir/keystore
laurindo_antonio2240@instance-1:~$ cd private-ethereum/
laurindo_antonio2240@instance-1:~/private-ethereum$ ls
```

```
laurindo_antonio2240@instance-1:~/private-ethereum$ cd myDataDir/
laurindo_antonio2240@instance-1:~/private-ethereum/myDataDir$ ls
geth  geth.ipc  keystore
laurindo_antonio2240@instance-1:~/private-ethereum/myDataDir$ cd keystore/
laurindo_antonio2240@instance-1:~/private-ethereum/myDataDir/keystore$ ls
UTC--2019-10-03T19-11-09.983944471Z--82c1ee0a4393f3777fd90cb87553525b40c7e0d4
UTC--2019-10-03T19-12-41.355716052Z--c1c2fc1eb3ab457e12d3cd9c1fadba2447a8a6a7
laurindo_antonio2240@instance-1:~/private-ethereum/myDataDir/keystore$ |
```

Check the balance of these accounts

```
> eth.accounts
["0x82c1ee0a4393f3777fd90cb87553525b40c7e0d4", "0xc1c2fc1eb3ab457e12d3cd9c1fadba2447a8a6a7"]
> web3.fromWei(eth.getBalance("0x82c1ee0a4393f3777fd90cb87553525b40c7e0d4"), "ether")
100000
> web3.fromWei(eth.getBalance("0xc1c2fc1eb3ab457e12d3cd9c1fadba2447a8a6a7"), "ether")
120000
> |
```

Making A Transaction

```
> eth.sendTransaction({from:eth.accounts[0], to:eth.accounts[1], value: web3.toWei(1000, "ether")})
Error: authentication needed: password or unlock
    at web3.js:3143:20
    at web3.js:6347:15
    at web3.js:5081:36
    at <anonymous>:1:1
> |
```

```
> personal.unlockAccount(eth.accounts[0], "xical71178")
true
> eth.sendTransaction({from:eth.accounts[0], to:eth.accounts[1], value: web3.toWei(1000, "ether")})
"0x03e388b428e3ee2627d72286628c7262c52b0314089003679aa1ff553083c49c"
> |
```